

SERVICE MANUAL & TROUBLESHOOTING GUIDE FOR

15EX2

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MAY. 2001



LCD MONITOR 15EX2 MAINTENANCE

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LCD MONITOR 15EX2 MAINTENANCE

1. 15EX2-TA Product Specification

1.1 SCOPE

The MiTAC 15EX2-TA (TFT with analog signal input) is a high resolution (max. resolution 1024 X 768) color LCD monitor which uses 15" high contrast TFT-LCD panel.

This monitor supplies user with following features:

- ☐ On screen display adjustment function
- ☐ DPMS power saving function
- ☐ VESA standard compatible ME design
- ☐ Swivel function of display panel
- ☐ Plug & Play (DDC1/2B) function

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1.2 MAIN CHARACTERISTICS

1.2.1 LCD PANEL:(The detailed spec. please refer to Sharp LD-11904D document)

LCD panel: 15" color TFT-LCD

Model no.: Sharp LQ150X1DG51

PARAMETER		SPECIFICATIONS	UNIT	Remark
DISPLAY SIZE		38 (Diagonal)	cm	
		15.0 (Diagonal)	inch	
ACTIVE AREA		304.1(H)X228.1(V)	mm	
VIEW ANGLE RANGE	HORIZONTAL	140° (Typ.)	Deg.	
	VERTICAL	120° (Typ.)		
PIXEL FORMAT		1024(H)X768(V) (1 pixel = R+G+B dots)	pixel	
PIXEL PITCH		0.297(H)X0.297(V)	mm	
PIXEL CONFIGURATION		R,G,B vertical stripe		
DISPLAY MODE		Normally white		
UNIT OUTLINE DIMENSIONS		340(W)X264(V)X15.0(D) (Typ.)	mm	
Back-Light		Top/Bottom edge side 4-CCFL type		
WEIGHT		Max. 1350	g	
SURFACE TREATMENT		Anti-glare, and hard-coating 2H		
CONTRAST RATIO		300:1(Typ.)		
DISPLAY COLOR		6 bit, 262,144 colors	colors	
BRIGHTNESS		220(Typ.)	cd/m ²	
RESPONSE TIME		Tr=10	ms	
		Tf=35		

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1.2.2 SIGNAL INPUT CABLE:

High density 15 pins “D” type, male connector cable.

1.2.3 VIDEO SIGNAL:

Max. 80 MHz bandwidth

Input video voltage range: 0.6~0.95 Vp-p, typ.: 0.7 Vp-p

Impedance: $75\ \Omega \pm 5\%$ / 50 pF(max.)

1.2.4 SCAN FREQUENCY:

Horizontal frequency: 24.8 ~ 60 kHz

Vertical frequency: 56 ~ 75 Hz

Polarity (positive or negative): 3V ~5V

Input impedance: 470 Ω (min.)/ 1000 pF(max.)

1.2.5 SYNC PROCESS:

Separate SYNC is acceptable.

1.2.6 SWIVEL:

Up/Down: 25°/-3°.

1.2.7 PLUG & PLAY:

DDC1/DDC2B

1.2.8 EXTERNAL CONTROLLER & OUTLET:

LCD control key: MENU, SELECT, -, +, POWER.

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1.2.9 AC INPUT POWER:

Max. 264 Vac/50 Hz, Min. 90 Vac/60 Hz

Normal 100 ~240 Vac/60 ~50 Hz

1.2.10 POWER SAVING FUNCTION & INDICATOR COMPLY WITH VESA DPMS

MODE	H-SYNC	V-SYNC	POWER CONSUMPTION	LED INDICATOR
NORMAL	WITH	WITH	≤35W	G/ON
STAND-BY	WITHOUT	WITH	< 5W	Y/ON
SUSPEND	WITH	WITHOUT	< 5W	Y/ON
SIGNAL OFF	WITHOUT	WITHOUT	< 5W	Y/OFF

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1.2.11 COMPATIBLE TIMING CHART:

MODE	RESOLUTION	H-FREQ(KHz)	V-FREQ(Hz)	DOT CLOCK(MHz)
VESA IBM-AT PC-9800	640X480	31.5	60.0	25.175
		37.9	72.0	31.500
		37.5	75.0	31.500
	800X600	35.1	56.0	36.000
		37.9	60.0	40.000
		48.1	72.0	50.000
		46.9	75.0	49.500
	1024X768	48.4	60.0	65.000
		56.5	70.0	75.000
		60.0	75.0	78.750
US Text	720X400	31.5	70.0	28.300
PC-9800	640X400	24.8	56.4	21.053
		31.5	70.0	25.175
Power Mac	640X480	35.0	66.7	30.200
	832X624	49.7	74.6	57.300
	1024X768	60.2	75.0	80.000

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1.2.12 OSD ADJUSTED FUNCTION :



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	Item	Values Range	Default Value
Menu 1 	CLOCK	0 to 255	127
	PHASE	0 to 63	30
	H-POS	0 to 255	127
	V-POS	0 to 31	15
Menu 2 	BRIGHTNESS	0 to 63	40
	CONTRAST	0 to 63	40
	COLORS		16M
Menu 3 	COOL STD WARM USER		STD
	RED	0 to 63	31
	GREEN	0 to 63	31
	BLUE	0 to 63	31
Menu 4 	OSD H-POS		
	OSD V-POS		
	ALL RESET	NO/YES	NO

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❑ Color Temperature Definition:

	Color temperature	Chromaticity of white	
		X	Y
COOL	9300K	0.285±10%	0.296±10%
STD	6500K	0.313±10%	0.329±10%
WARM	5500K	0.329±10%	0.343±10%

❑ Key definition :

Menu, Select, Left (Decrease, ←), Right (Increase, →) and Power 5 keys.

Select Key : Only one shot of Select Key is available. (Continuous pressing is not available.)

←, → Key : Continuous pressing is available.

❑ Key Operation :

Pushing "Menu" key, the OSD window will pop out. The default value will focus on the first icon.

Keep pushing "Menu" key, the highlight will go to next item. The sequence is "DISP ADJUSTMENT" menu → "WHITE BALANCE" menu → "COLOR ADJUSTMENT" menu → "MISC" menu.

The different icon will come out different OSD items. Using "Select" key can choose different item. The "Decrease" and "Increase" keys will change the value for that item which is selected by "Select" key.

❑ Display Message :

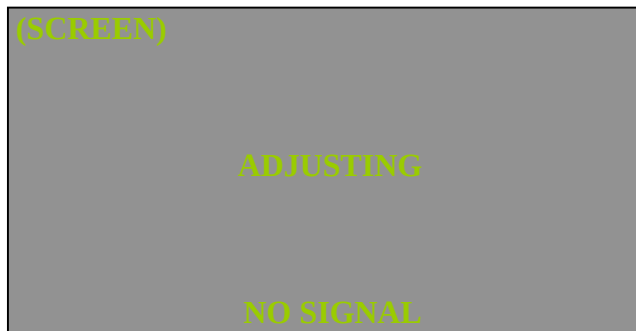
ADJUSTING	- - - displayed while adjustment is performed
OUT OF ADJUST	- - - displayed when AA or AGC can not adjust
OUT OF TIMING	- - - displayed when H_sync. or V_sync. are out of range
NO SIGNAL	- - - displayed when there is no signal

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Message :

	Size	Position	Front Color	Back Color
ADJUSTING	double	center	Blue	White
OUT OF ADJUST	double	center	Blue	White
OUT OF TIMING	double	center	Blue	White
NO SIGNAL	double	bottom	Blue	White

Message Displayed Position :



❑ Secret Key Operation :

AGING : "Menu" + "Select" + "Right(->)" and "Power" ON

VERSION : "Menu" + "Left(<-)" + "Right(->)" and "Power" ON

Version Displayed Position :

MODEL NAME : LCD-15MAT

VERSION : R00

CKS : XXXX

LCD MONITOR 15EX2 MAINTENANCE

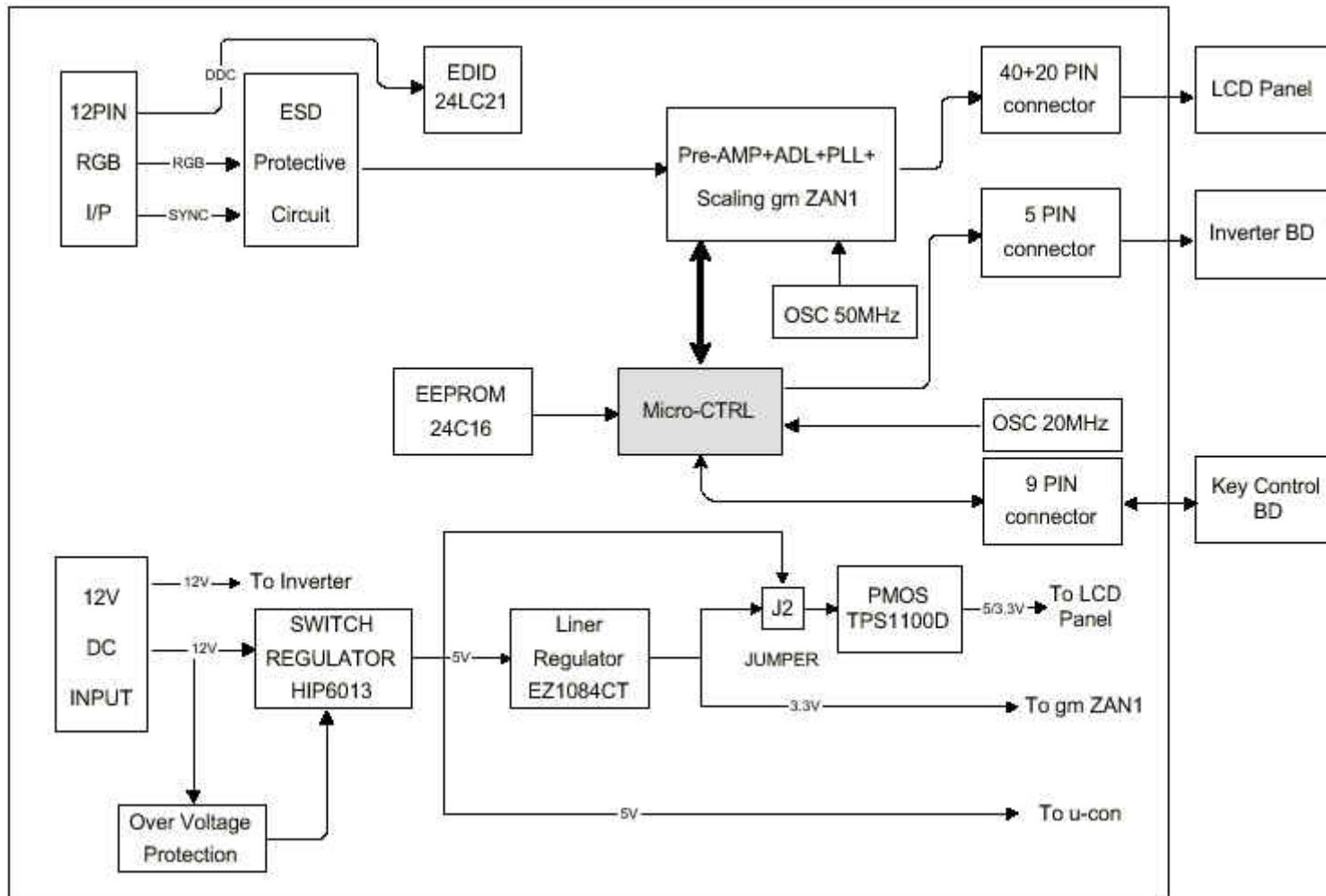
❑ OSD OFF time :

"MENU" and "Version"	15 second
"NO SIGNAL", "OUT OF TIMING"	10 second
"OUT OF ADJUST"	5 second

❑ OSD Value: Each OSD value is memorized on EEPROM.

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1.3 HARDWARE SYSTEM BLOCK DIAGRAM



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1.4. POWER SUPPLY (AC-ADAPTER)

Model name: API-208-98010L

AC Characteristic	Min.	Max.	Comment
Input Voltage	90 V _{ac}	264 V _{ac}	Universal
Line Frequency	47 Hz	63 Hz	
Inrush current	N/A	Note 2	
Efficiency			Note 1

Note 1: 68%(min.) at full load, 115Vac/60Hz

Note 2: No max. limits but in hot start shall no damage & Fuse could not open.

DC Output	+12 V	
Current (min.)	45 mA	
Current (max.)	3 A	
Ripple & Noise	120 mV	Note 1
Regulation	+5%	Note 1
Over Voltage Protection	18V	
Shot Circuit Protection	Yes	
DC Power ON Rise Time	<100 ms	Full Load
Overshoot	13.2 V	
Hold Up Time	20 ms	115 V _{ac} / 60Hz/Full Load (36W)
	20 ms	100 V _{ac} / 50Hz/12V, 2.5A, 30W (15EX2 system loading)

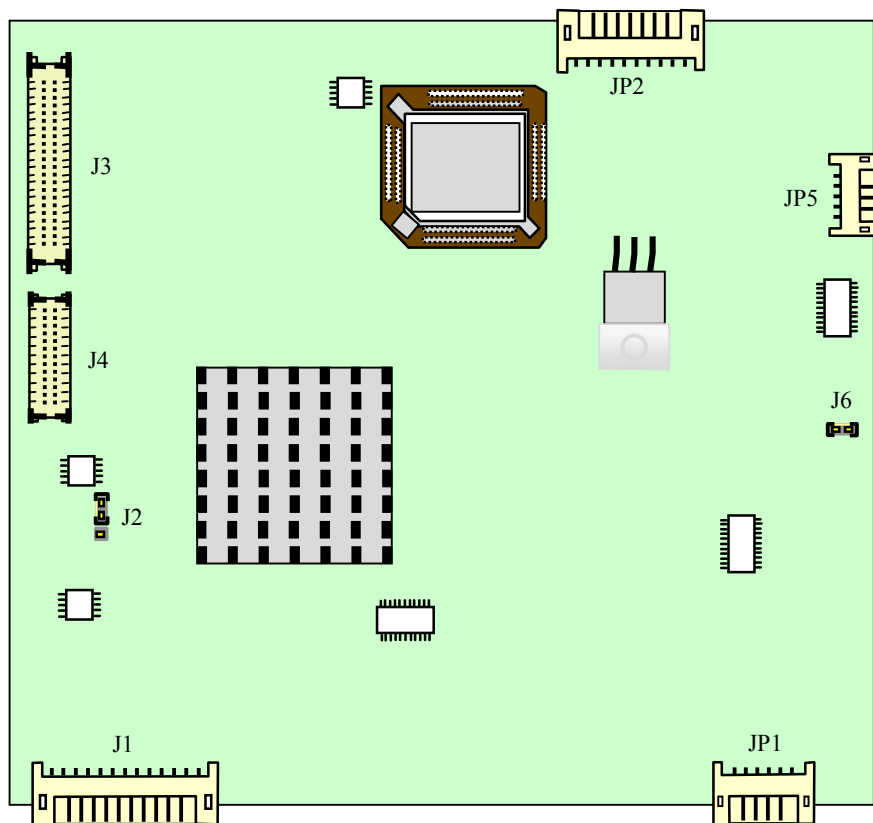
Note 1: The ripple and regulation shall be maintained in the SPEC for all combinations of below condition:

- ☐ min. & max. output current.
- ☐ min. & max. AC input voltage.
- ☐ min. & max. AC input frequency.

LCD MONITOR 15EX2 MAINTENANCE

2. Definition & Location Of Connectors & Jumpers

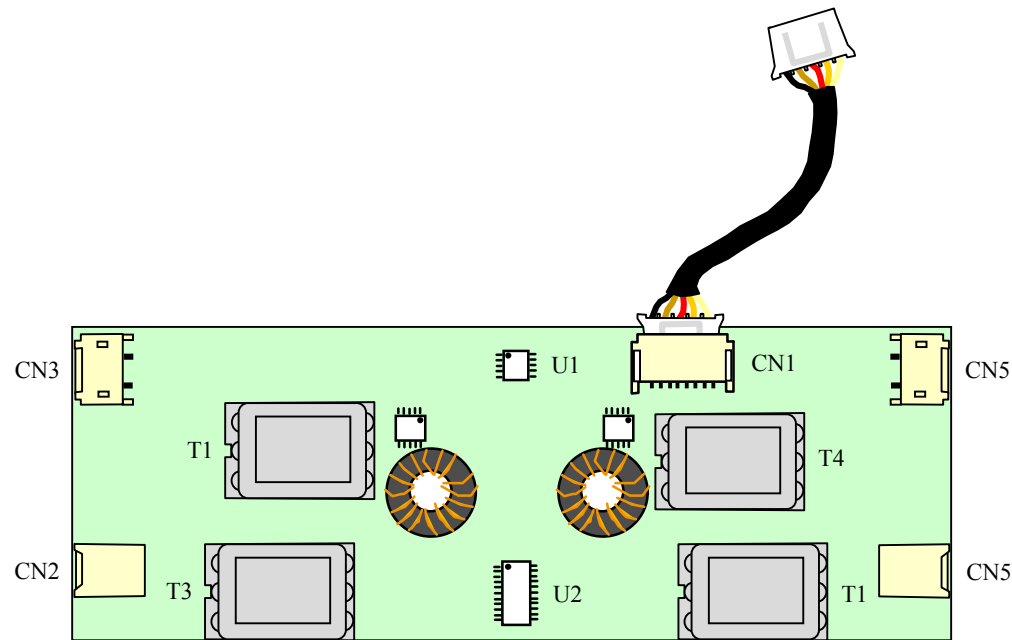
15EX2 Interface Board



- ❑ **J1 : VGA Input Cable Connector.**
- ❑ **J2 : Panel VDD Selector.**
- ❑ **J3 : 40 Pins To LCD Module Connector.**
- ❑ **J4 : 20 Pins To LCD Module Connector.**
- ❑ **JP1 : To DC Jack Board Power Connector.**
- ❑ **JP2 : To Key Switch Board Connector.**
- ❑ **JP5 : To Inverter Board Connector.**

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2. Definition & Location Of Connectors & Jumpers Invertor Board



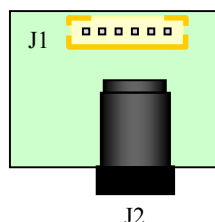
❑ **CN1 : Inverter Board Connector.**

❑ **CN2,CN3,CN4,CN5 : Inverter BD to LCD panel Connector.**

LCD MONITOR 15EX2 MAINTENANCE

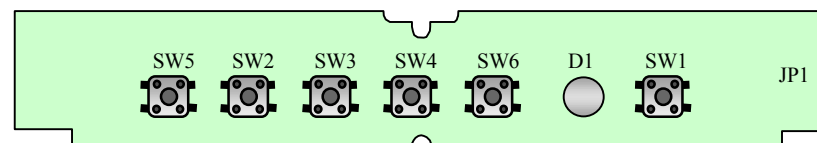
2. Definition & Location Of Connectors & Jumpers

Power Board



- ❑ J1 : Power Adaptor BD Connector.
- ❑ J2 : Power Adaptor Connector.

Key Switch Board

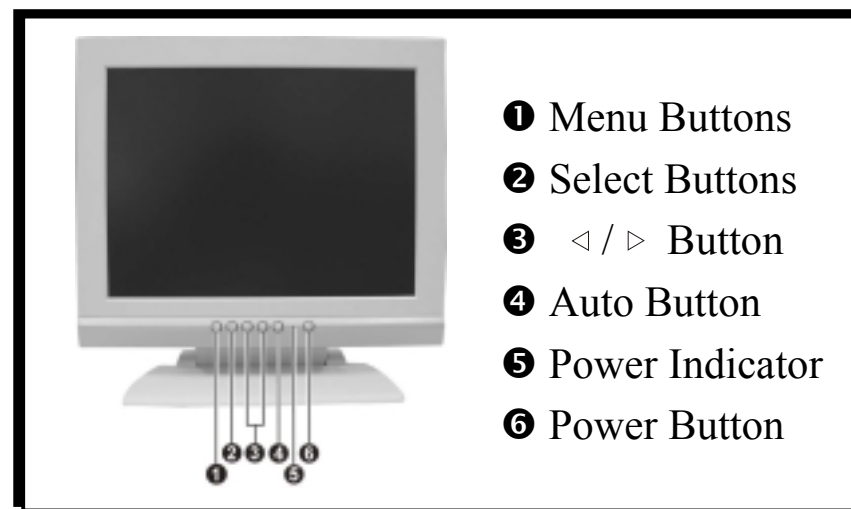


- ❑ SW1 : Power Button.
- ❑ SW2,SW5 : Adjust Button.
- ❑ SW3,SW4 : OSD Select Button.
- ❑ SW6 : Auto Button.
- ❑ D1 : Power Indicator.

Power Board J1

- Power Input connector
- Connector: S6B-PH-SM3-TB (JST)

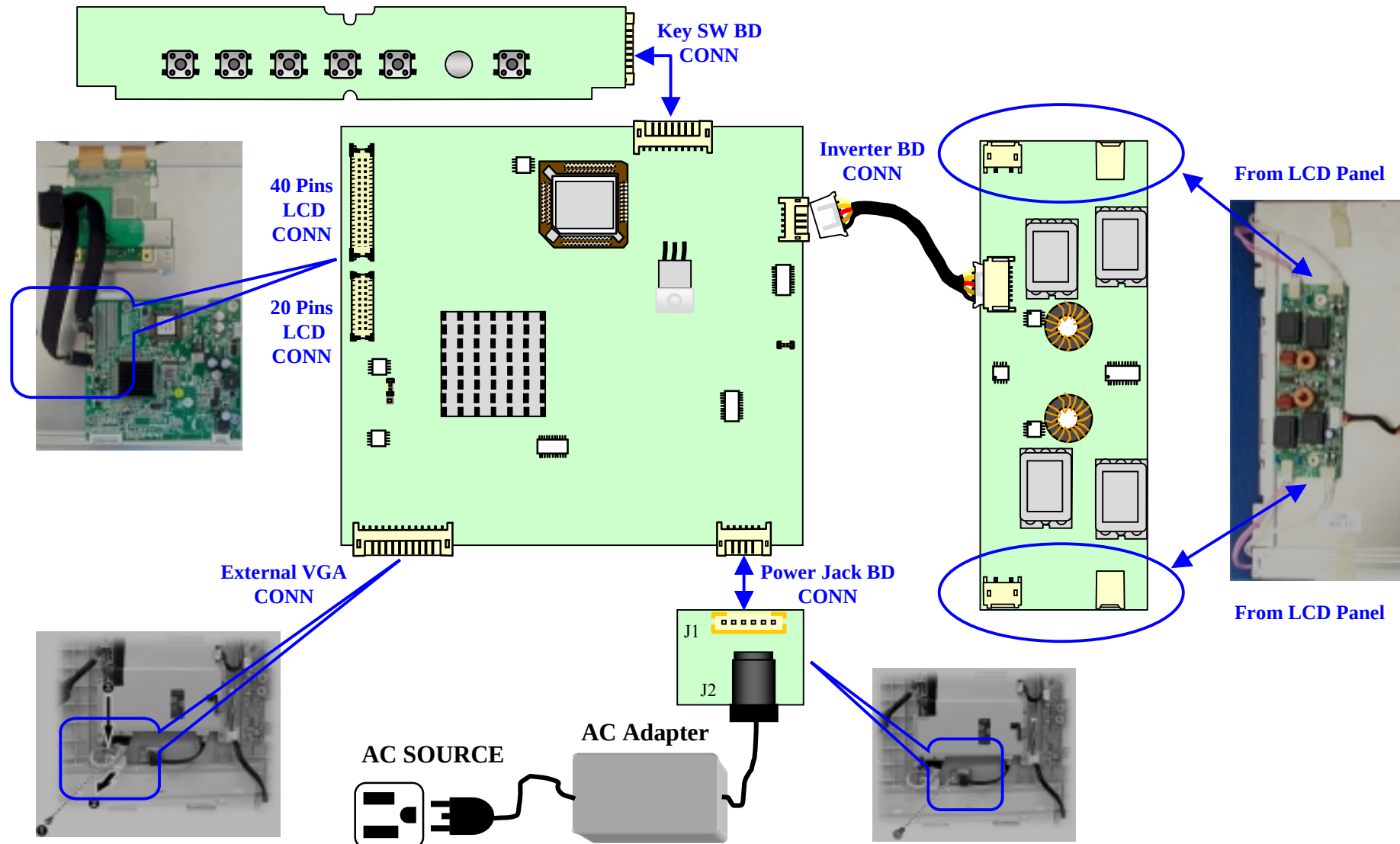
Pin No.	Symbol	Description
6	12V	+12Vdc
5	12V	+12Vdc
4	GND	Ground
3	GND	Ground
2	+5V	+5Vdc(option)
1	+5V	+5Vdc(option)



- ❶ Menu Buttons
- ❷ Select Buttons
- ❸ ◀ / ▶ Button
- ❹ Auto Button
- ❺ Power Indicator
- ❻ Power Button

LCD MONITOR 15EX2 MAINTENANCE

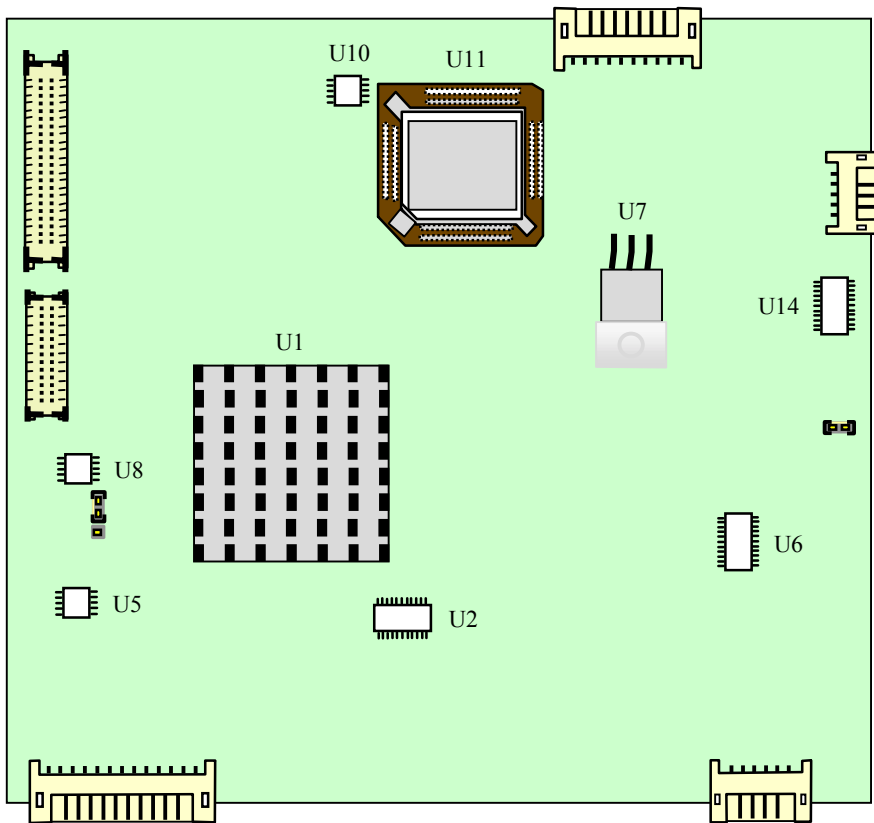
2. Definition & Location Of Connectors & Jumpers



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3. Location Of Major Components

15EX2 Interface Board



- ❑ **U1 : gmZAN1 Flat Panel Monitor Controller IC.**
- ❑ **U2 : 74F14 Hex Schmitt Trigger Inverters.**
- ❑ **U3 : M52347 (N/A).**
- ❑ **U5 : 24C21 EDID.**
- ❑ **U6 : HIP6013 Switch Regulator.**
- ❑ **U7 : EZ1084CT Linear Regulator.**
- ❑ **U10 : 24LC16B Configuration Data.**
- ❑ **U11 : M6759 Micom.**
- ❑ **U14 : 74HCT74 Dual D-type Flip-Flop.**

LCD MONITOR 15EX2 MAINTENANCE

4. Pin Description Of Major Components

4.1 gmZAN1 Flat Panel Controller IC

Features

The gmZAN1 device utilizes Genesis' patented third-generation Advanced Image Magnification technology as well as a proven integrated ADC/PLL to provide excellent image quality within a cost-effective SVGA / XGA LCD monitor solution.

As a pin-compatible replacement for the gmB120, the gmZAN1 incorporates all of the gmB120 features plus many enhanced features; including 10-bit gamma correction, Adaptive Contrast Enhancement (ACE) filtering, Sync On Green (SOG), and an enhanced OSD.

Features

- ~ Fully integrated 135MHz 8-bit triple-ADC, PLL, and pre-amplifier
- ~ gmZ2 scaling algorithm featuring new Adaptive Contrast Enhancement (ACE)
- ~ On-chip programmable OSD engine
- ~ Integrated PLLs
- ~ 10-bit programmable gamma correction
- ~ Host interface with 1 or 4 data bits
- ~ Pin-compatible with gmB120

● Integrated Analog Front End

- ~ Integrated 8-bit triple ADC
- ~ Up to 135MHz sampling rates
- ~ No additional components needed
- ~ All color depths up to 24-bits/pixel are supported

● High-Quality Advanced Scaling

- ~ Fully programmable zoom
- ~ Independent horizontal / vertical zoom
- ~ Enhanced and adaptive scaling algorithm for optimal image quality
- ~ Recovery Mode / Native Mode

LCD MONITOR 15EX2 MAINTENANCE

- Input Format
 - ~ Analog RGB up to XGA 85Hz
 - ~ Support for Sync On Green (SOG)
 - ~ Support for composite sync modes
- Output Format
 - ~ Support for 8 or 6-bit panels (with high quality dithering)
 - ~ One or two pixel output format
- Built In High-Speed Clock Generator
 - ~ Fully programmable timing parameters
 - ~ On-chip PLLs generate clocks for the on-chip ADC and pixel clock from a single reference oscillator
- Auto-Configuration / Auto-Detection
 - ~ Phase and image positioning
 - ~ Input format detection
- Operating Modes
 - ~ Bypass mode with no filtering
 - ~ Multiple zoom modes:
 - with filtering
 - with adaptive (ACE) filtering
- Integrated On-Screen Display
 - ~ On-chip character RAM and ROM for better customization
 - ~ External OSD supported for greater flexibility
 - ~ Supports both landscape and portrait fonts
 - ~ Many other font capabilities including: blinking, overlay and transparency

Package

- ~ Cooperate with “ SiS Video Bridge ”to Support

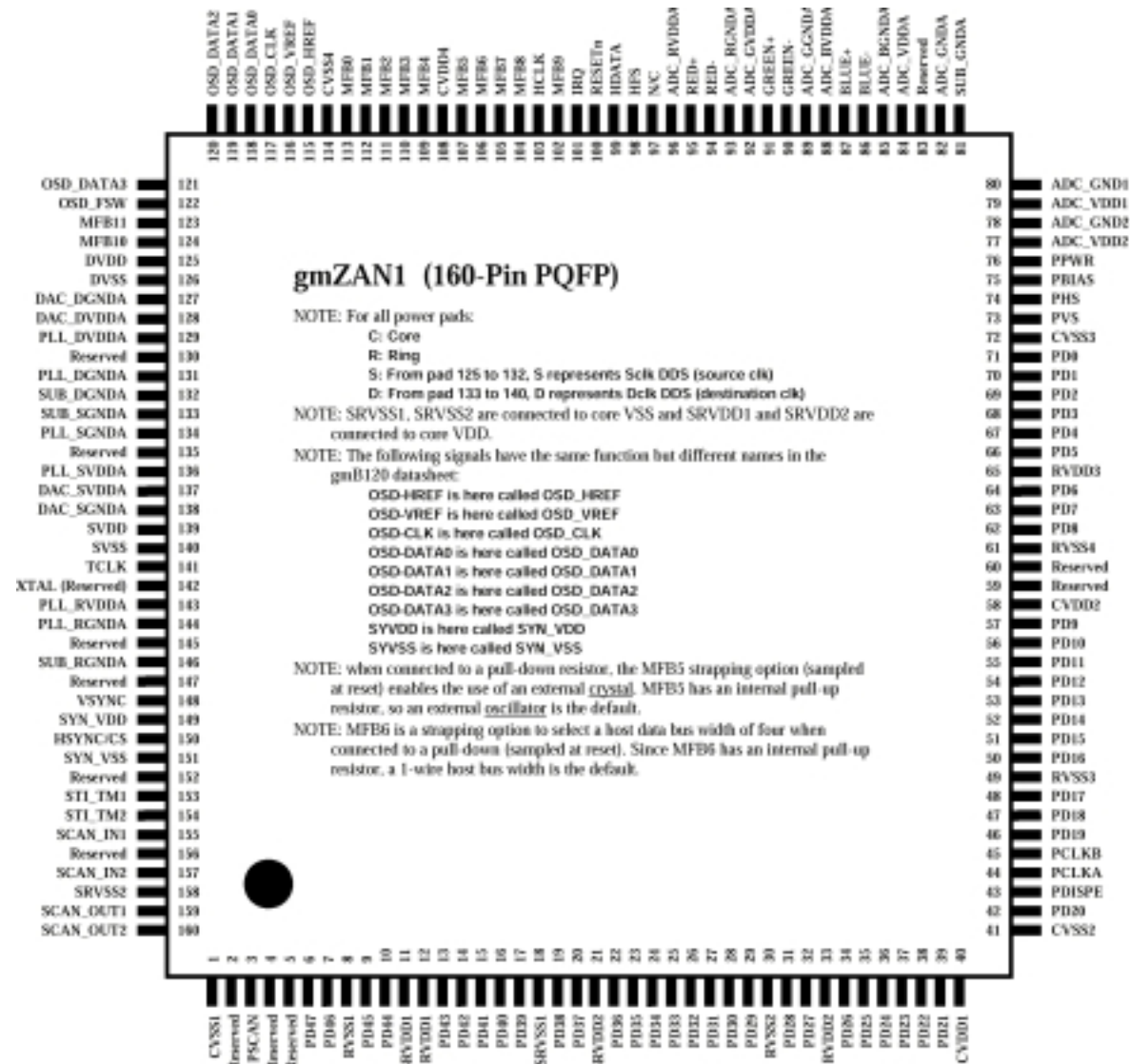
Applications

- ~ Multi-synchronous LCD monitors
- ~ Other fixed-resolution pixelated display devices

LCD MONITOR 15EX2 MAINTENANCE

4.1 gmZAN1 Flat Panel Controller IC

Figure 1. gmZAN1 Pin Diagram



LCD MONITOR 15EX2 MAINTENANCE

4. Pin Description Of Major Components

4.1 gmZAN1 Flat Panel Controller IC -1

Unless otherwise stated, unused input pins must be tied to ground, and unused output pins left open.

Analog-to-Digital Converter.

Pin	Name	I/O	Drive Current (@10pF)	Description
77	ADC_VDD2			Digital power for ADC encoding logic. Must be bypassed with 0.1 uF capacitor to pin 78 (ADC_GND2)
78	ADC_GND2			Digital GND for ADC encoding logic. Must be directly connected to the digital system ground plane.
79	ADC_VDD1			Digital power for ADC clocking circuit. Must be bypassed with 0.1 uF capacitor to pin 80 (ADC_GND1)
80	ADC_GND1			Digital GND for ADC clocking circuit. Must be directly connected to the digital system ground plane.
81	SUB_GNDA			Dedicated pin for substrate guard ring that protects the ADC reference system. Must be directly connected to the analog system ground plane.
82	ADC_GNDA			Analog ground for ADC analog blocks that are shared by all three channels. Includes bandgap reference, master biasing and full scale adjust. Must be directly connected to analog system ground plane.
84	ADC_VDDA			Analog power for ADC analog blocks that are shared by all three channels. Includes bandgap reference, master biasing and full scale adjust. Must be bypassed with 0.1 uF capacitor to pin 82 (ADC_GNDA).
83	Reserved			For internal testing purpose only. Do not connect.
85	ADC_BGND			Analog ground for the blue channel. Must be directly connected to the analog system ground plane.
88	ADC_BVDDA			Analog power for the blue channel. Must be bypassed with 0.1 uF capacitor to pin 85 (BGND).
86	BLUE-	In		Negative analog input for the Blue channel.
87	BLUE+	In		Positive analog input for the Blue channel.
89	ADC_GGNDA			Analog ground for the green channel. Must be directly connected to the analog system ground plane.
92	ADC_GVDDA			Analog power for the green channel. Must be bypassed with 0.1 uF capacitor to pin 89 (ADC_GGNDA).
90	GREEN-	In		Negative analog input for the Green channel.
91	GREEN+	In		Positive analog input for the Green channel.
93	ADC_RGNDA			Analog ground for the red channel. Must be directly connected to the analog system ground plane.

Analog-to-Digital Converter

Pin	Name	I/O	Drive Current (@10pF)	Description
96	ADC_RVDDA			Analog power for the red channel. Must be bypassed with 0.1 uF capacitor to pin 93 (ADC_RGNDA).
94	RED-	In		Negative analog input for the Red channel.
95	RED+	In		Positive analog input for the Red channel.

Host Interface (HIF) / External On-Screen Display

Pin	Name	I/O	Drive Current (@10pF)	Description
98	HFS	In		Host Frame Sync. Frames the packet on the serial channel.
103	HCLK	In		Clock signal input for the 3-wire serial communication.
99	HDATA	in/out	4 mA	Data signal for the 3-wire serial communication
100	RESEn	In		Resets the gmZAN1 chip to a known state when low.
101	IRQ	out	4 mA	Interrupt request output
115	OSD-HREF	out	4 mA	HSYNC output for an external OSD controller chip.
116	OSD-VREF	out	4 mA	VSYSN output for an external OSD controller chip.
117	OSD-Clk	out	8 mA	Clock output for an external OSD controller chip.
118	OSD-Data0	in		Data input 0 from an external OSD controller.
119	OSD-Data1	in		Data input 1 from an external OSD controller.
120	OSD-Data2	in		Data input 2 from an external OSD controller.
121	OSD-Data3	in		Data input 3 from an external OSD controller.
122	OSD-FSW	in		External OSD window display enable. Displays data from external OSD controller when high.
123	MFB11	in/out	8 mA	Multi-Function Bus 11. One of twelve multi-function signals MFB[11:0].
124	MFB10	in/out	8 mA	Multi-Function Bus 10. One of twelve multi-function signals MFB[11:0].
102	MFB9	in/out	8 mA	Multi-Function Bus 9. One of twelve multi-function signals MFB[11:0]. Also used as HDATA3 in a 4-bit host interface configuration.
104	MFB8	in/out	8 mA	Multi-Function Bus 8. One of twelve multi-function signals MFB[11:0]. Also used as HDATA2 in a 4-bit host interface configuration.
105	MFB7	in/out	8 mA	Multi-Function Bus 7. One of twelve multi-function signals MFB[11:0]. Also used as HDATA1 in a 4-bit host interface configuration.

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4. Pin Description Of Major Components

4.1 gmZAN1 Flat Panel Controller IC -2

Host Interface (HIF) / External On-Screen Display

Pin	Name	I/O	Drive Current (@10pF)	Description
107	MFB5	in/out	8 mA	Multi-Function Bus 5. One of twelve multi-function signals MFB[11:0]. Internally pulled up. When externally pulled down (sampled at reset) the chip uses an external crystal resonator across pins 141 and 142, instead of an oscillator.
109	MFB4	in/out	8 mA	Multi-Function Bus 4. One of twelve multi-function signals MFB[11:0].
110	MFB3	in/out	8 mA	Multi-Function Bus 3. One of twelve multi-function signals MFB[11:0].
111	MFB2	in/out	8 mA	Multi-Function Bus 2. One of twelve multi-function signals MFB[11:0].
112	MFB1	in/out	8 mA	Multi-Function Bus 1. One of twelve multi-function signals MFB[11:0].
113	MFB0	in/out	8 mA	Multi-Function Bus 0. One of twelve multi-function signals MFB[11:0].

Clock Recovery / Time Base Conversion

Pin	Name	I/O	Drive Current (@10pF)	Description
125	DVDD			Digital power for Destination DDS (direct digital synthesizer). Must be bypassed with a 0.1 uF capacitor to digital ground plane.
127	DAC_DGND			Analog ground for Destination DDS DAC. Must be directly connected to the analog system ground plane.
128	DAC_DVDD			Analog power for Destination DDS DAC. Must be bypassed with a 0.1 uF capacitor to pin 127 (DAC_DGND).
129	PLL_DVDD			Analog power for the Destination DDS PLL. Must be bypassed with a 0.1 uF capacitor to pin 131 (PLL_DGND).
130	Reserved			For testing purposes only. Do not connect.
131	PLL_DGND			Analog ground for the Destination DDS PLL. Must be directly connected to the analog system ground plane.
132	SUB_DGND			Dedicated pin for the substrate guard ring that protects the Destination DDS. Must be directly connected to the analog system ground plane.
133	SUB_SGND			Dedicated pin for the substrate guard ring that protects the Source DDS. Must be directly connected to the analog system ground plane.

Pin	Name	I/O	Drive Current (@10pF)	Description
134	PLL_SGND			Analog ground for the Source DDS PLL. Must be directly connected to the analog system ground.
135	Reserved			For testing purposes only. Do not connect.
136	PLL_SVDD			Analog power for the Source DDS PLL. Must be bypassed with a 0.1 uF capacitor to pin 134 (PLL_SGND).
137	DAC_SVDD			Analog power for the Source DDS DAC. Must be bypassed with a 0.1 uF capacitor to pin 138 (DAC_SGND).
138	DAC_SGND			Analog ground for the Source DDS DAC. Must be directly connected to the analog system ground.
139	SVDD			Digital power for the Source DDS. Must be bypassed with a 0.1 uF capacitor to digital ground plane.
141	TCLK	in		Reference clock (TCLK) input from the 50 Mhz crystal oscillator.
142	XTAL	out		If using an external oscillator, leave this pin floating. If using an external crystal, connect crystal between TCLK (141) and XTAL (142). See MFB5 (pin 107).
143	PLL_RVDD			Analog power for the Reference DDS PLL. Must be bypassed with a 0.1 uF capacitor to pin 144 (PLL_RGND).
144	PLL_RGND			Analog ground for the Reference DDS PLL. Must be directly connected to the analog system ground plane.
145	Reserved			For testing purposes only. Do not connect.
146	SUB_RGND			Dedicated pin for the substrate guard ring that protects the Reference DDS. Must be directly connected to the analog system ground plane.
148	VSYNC	in		CRT Vsync input. TTL Schmitt trigger input.
149	SYN_VDD			Digital power for CRT Sync input
150	HSYNC/CSYNC	in		CRT Hsync or CRT composite sync input. TTL Schmitt trigger input.

LCD MONITOR 15EX2 MAINTENANCE

4. Pin Description Of Major Components

4.1 gmZAN1 Flat Panel Controller IC -3

TFT Panel Interface

Pin	Name	I/O	Drive Current (@10pF)	Description				
				2pxl/clock 8-bit	2pxl/clock 6-bit	1pxl/clock 8-bit	1pxl/clock 6-bit	TFT
6	PD47	out	2 mA ~ 20 mA	OB1	-	-	-	
7	PD46	out	2 mA ~ 20 mA	OB0	-	-	-	
9	PD45	out	2 mA ~ 20 mA	OG1	-	-	-	
10	PD44	out	2 mA ~ 20 mA	OG0	-	-	-	
13	PD43	out	2 mA ~ 20 mA	OR1	-	-	-	
14	PD42	out	2 mA ~ 20 mA	OR0	-	-	-	
15	PD41	out	2 mA ~ 20 mA	EB1	-	B1	-	
16	PD40	out	2 mA ~ 20 mA	EB0	-	B0	-	
17	PD39	out	2 mA ~ 20 mA	EG1	-	G1	-	
19	PD38	out	2 mA ~ 20 mA	EG0	-	G0	-	
20	PD37	out	2 mA ~ 20 mA	ER1	-	R1	-	
22	PD36	out	2 mA ~ 20 mA	ER0	-	R0	-	
23	PD35	out	2 mA ~ 20 mA	OB7	OB5	-	-	
24	PD34	out	2 mA ~ 20 mA	OB6	OB4	-	-	
25	PD33	out	2 mA ~ 20 mA	OB5	OB3	-	-	
26	PD32	out	2 mA ~ 20 mA	OB4	OB2	-	-	
27	PD31	out	2 mA ~ 20 mA	OB3	OB1	-	-	
28	PD30	out	2 mA ~ 20 mA	OB2	OB0	-	-	
29	PD29	out	2 mA ~ 20 mA	OG7	OG5	-	-	
31	PD28	out	2 mA ~ 20 mA	OG6	OG4	-	-	
32	PD27	out	2 mA ~ 20 mA	OG5	OG3	-	-	
34	PD26	out	2 mA ~ 20 mA	OG4	OG2	-	-	
35	PD25	out	2 mA ~ 20 mA	OG3	OG1	-	-	
36	PD24	out	2 mA ~ 20 mA	OG2	OG0	-	-	
37	PD23	out	2 mA ~ 20 mA	OR7	OR5	-	-	
38	PD22	out	2 mA ~ 20 mA	OR6	OR4	-	-	
39	PD21	out	2 mA ~ 20 mA	OR5	OR3	-	-	
42	PD20	out	2 mA ~ 20 mA	OR4	OR2	-	-	
46	PD19	out	2 mA ~ 20 mA	OR3	OR1	-	-	
47	PD18	out	2 mA ~ 20 mA	OR2	OR0	-	-	
48	PD17	out	2 mA ~ 20 mA	EB7	EB5	B7	B5	
50	PD16	out	2 mA ~ 20 mA	EB6	EB4	B6	B4	
51	PD15	out	2 mA ~ 20 mA	EB5	EB3	B5	B3	
52	PD14	out	2 mA ~ 20 mA	EB4	EB2	B4	B2	
53	PD13	out	2 mA ~ 20 mA	EB3	EB1	B3	B1	
54	PD12	out	2 mA ~ 20 mA	EB2	EB0	B2	B0	
55	PD11	out	2 mA ~ 20 mA	EG7	EG5	G7	G5	
56	PD10	out	2 mA ~ 20 mA	EG6	EG4	G6	G4	

Pin	Name	I/O	Drive Current (@10pF)	Description				
				2pxl/clock 8-bit	2pxl/clock 6-bit	1pxl/clock 8-bit	1pxl/clock 6-bit	TFT
57	PD9	out	2 mA ~ 20 mA	EG5	EG3	G5	G3	
62	PD8	out	2 mA ~ 20 mA	EG4	EG2	G4	G2	
63	PD7	out	2 mA ~ 20 mA	EG3	EG1	G3	G1	
64	PD6	out	2 mA ~ 20 mA	EG2	EG0	G2	G0	
66	PD5	out	2 mA ~ 20 mA	ER7	ER5	R7	R5	
67	PD4	out	2 mA ~ 20 mA	ER6	ER4	R6	R4	
68	PD3	out	2 mA ~ 20 mA	ER5	ER3	R5	R3	
69	PD2	out	2 mA ~ 20 mA	ER4	ER2	R4	R2	
70	PD1	out	2 mA ~ 20 mA	ER3	ER1	R3	R1	
71	PD0	out	2 mA ~ 20 mA	ER2	ER0	R2	R0	
43	PDispE	out	2 mA ~ 20 mA	This output provides a panel display enable signal that is active when flat panel data is valid.				
74	PHS	out	2 mA ~ 20 mA	This output provides the panel line clock signal.				
73	PVS	out	2 mA ~ 20 mA	This output provides the frame start signal.				
44	PCLKA	out	2 mA ~ 20 mA	This output is used to drive the flat panel shift clock.				
45	PCLKB	out	2 mA ~ 20 mA	Same as PCLKA above. The polarity and the phase of this signal are independently programmable.				
75	Pbias	out	8 mA	This output is used to turn on / off the panel bias power or controls back-light.				
76	Ppwr	out	8 mA	This output is used to control the power to a flat panel.				

NOTE: Drive current of the panel output pins are programmable.

LCD MONITOR 15EX2 MAINTENANCE

4. Pin Description Of Major Components

4.1 gmZAN1 Flat Panel Controller IC -4

Test Pins

Pin	Name	I/O	Drive Current	Description
3	PSCAN	in		Enable automatic PCB assembly test. When this input is pulled high, the automatic PCB assembly test mode is entered. An internal pull-down resistor drives this input low for normal operation.
155	SCAN_IN1	in		Scan input 1 used for automatic PCB assembly testing.
157	SCAN_IN2	in		Scan input 2 used for automatic PCB assembly testing.
159	SCAN_OUT1	out		Scan output 1 used for automatic PCB assembly testing.
160	SCAN_OUT2	out		Scan output 2 used for automatic PCB assembly testing.
153	Reserved			
154	Reserved			

VDD / VSS for Core Circuitry, Host Interface, and Panel/Memory Interface

Pins	Description
65, 40, 33, 12	PVDD4 ~ PVDD1 for panel / memory interface. Connect to +3.3V. Must be the same voltage as the CVDD's.
149, 108, 58, 21, 11	SRVDD2-1, CVDD4, CVDD2-1 for core circuitry. Connect to +3.3V. Must be the same voltage as the PVDD's.
158, 151, 140, 126, 114, 72, 61, 49, 41, 30, 18, 8, 1	Digital grounds for core circuitry and panel / memory interface.

LCD MONITOR 15EX2 MAINTENANCE

5. Assembly & Disassembly

5.1 System View

5.1.1 Front View

- ❶ Menu Button
- ❷ Select Button
- ❸ - / + Buttons
- ❹ Power Indicator
- ❺ Power Button

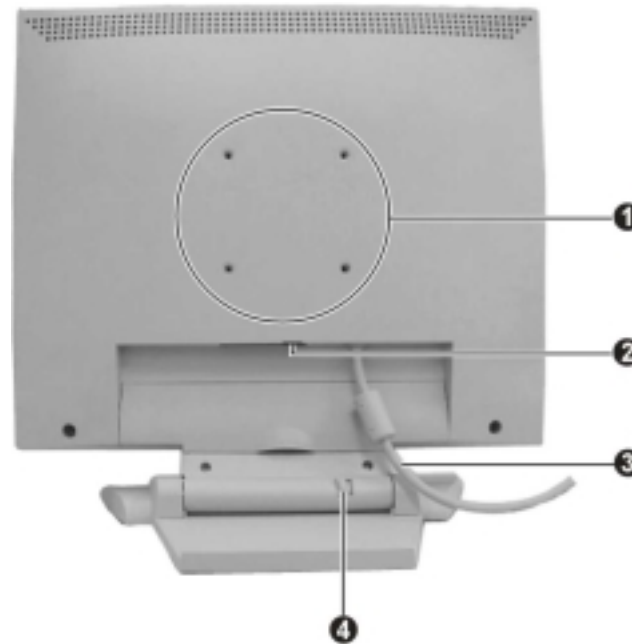


LCD MONITOR 15EX2 MAINTENANCE

5. Assembly & Disassembly

5.1.2 Rear View

- ❶ VESA Mounting Holes
- ❷ Power Connector
- ❸ Signal Cable
- ❹ Latch



LCD MONITOR 15EX2 MAINTENANCE

5. Assembly & Disassembly

5.2 System Disassembly

The section discusses at length each major component for disassembly/reassembly and show corresponding illustrations.

CAUTION: Before you start to install/replace these modules, 1) Turn off the power button on the rear panel of the monitor; 2) Disconnect the power cord from the electrical outlet and then from the monitor.

NOTE: During disassembly, 1) Label each cable as you disconnect it, noting its position and routing; 2) Keep all the screws.

LCD MONITOR 15EX2 MAINTENANCE

5. Assembly & Disassembly

5.2.1 LCD Panel

Disassembly

1. Remove the screw cover on the rear side of the monitor. (Figure 5-1)
2. Remove three screws. (Figure 5-2)



Figure 5-1



Figure 5-2

LCD MONITOR 15EX2 MAINTENANCE

5. Assembly & Disassembly

3. To detach the LCD frame, first lift the lower edge and then separate it from the housing. (Figure 5-3)
4. Disconnect the cable connected to the LCD frame. (Figure 5-4)



Figure 5-3



Figure 5-4

LCD MONITOR 15EX2 MAINTENANCE

5. Assembly & Disassembly

5. Remove four screws, then lift up the LCD panel slightly. (Figure 5-5)
6. Disconnect three cables connected to the LCD panel. (Figure 5-6)



Figure 5-5

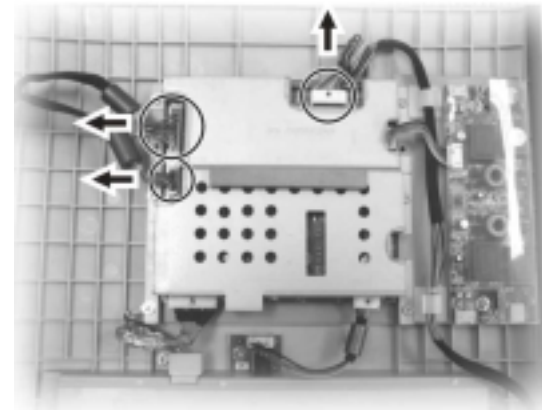


Figure 5-6

Reassembly

1. Reconnect the cables to the LCD panel, then fit the LCD panel into place and secure with four screws.
2. Reconnect the cable to the LCD frame, then fit the LCD frame back to the housing.
3. Secure three screws on the rear side of the monitor and replace the screw cover.

LCD MONITOR 15EX2 MAINTENANCE

5. Assembly & Disassembly

5.2.2 Power Connector Board

Disassembly

1. Detach the LCD panel. (See section 5.2.1)
2. Remove one screw locking the connector board, then you can lift up the connector board. (Figure 5-7)

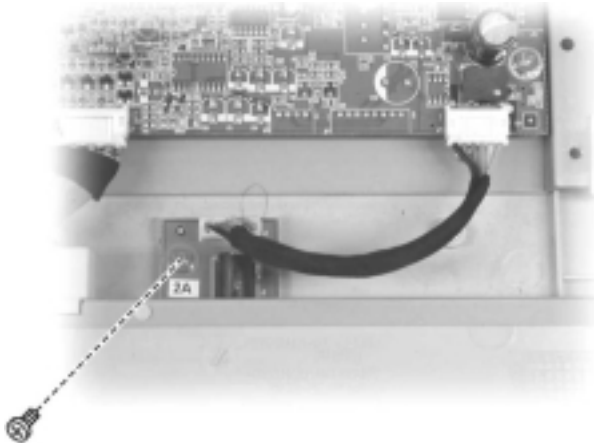


Figure 5-7

Reassembly

1. Fit the connector board into place and secure with one screw.
2. Reassemble the LCD panel.

LCD MONITOR 15EX2 MAINTENANCE

5. Assembly & Disassembly

5.2.3 Signal Cable

Disassembly

1. Detach the LCD panel. (See section 5.2.1)
2. Remove one screw locking the cover (❶) and lift it up (❷), then you can pull out the signal cable (❸). (Figure 5-8)

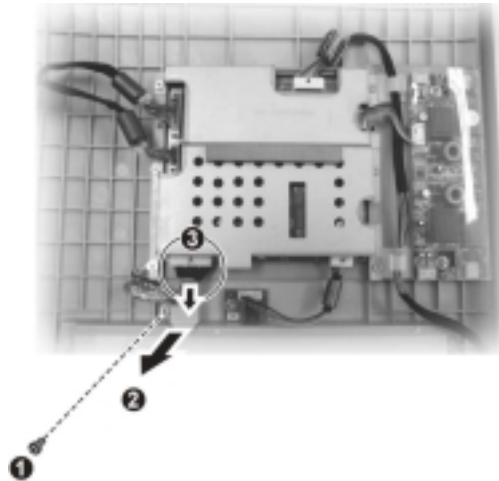


Figure 5-8

Reassembly

1. Replace the signal cable, fit the cover into place and secure with one screw.
2. Reassemble the LCD panel.

LCD MONITOR 15EX2 MAINTENANCE

5. Assembly & Disassembly

5.2.4 Base Unit

Disassembly

1. Remove the screw cover on the rear side of the monitor.
2. Remove four screws locking the base unit, and then lift the LCD panel up (see figure 5-9).

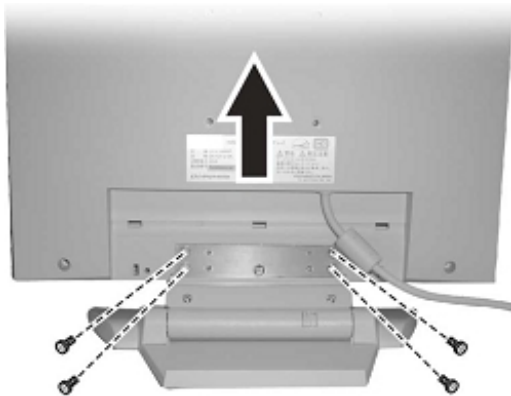


Figure 5-9

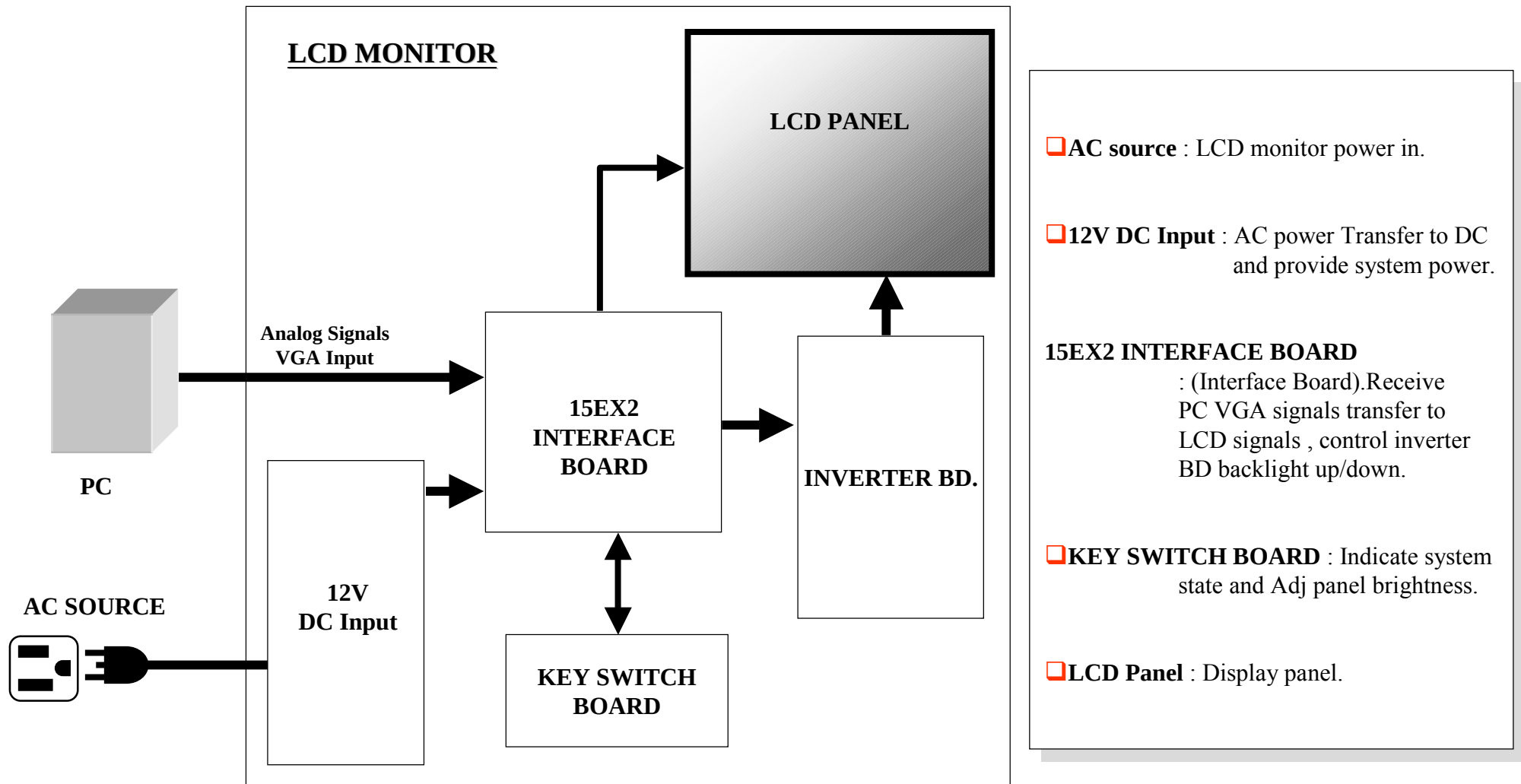
Reassembly

1. Replace the base unit and secure with four screws.
2. Replace the screw cover.

LCD MONITOR 15EX2 MAINTENANCE

6. 15EX2 Block Diagram

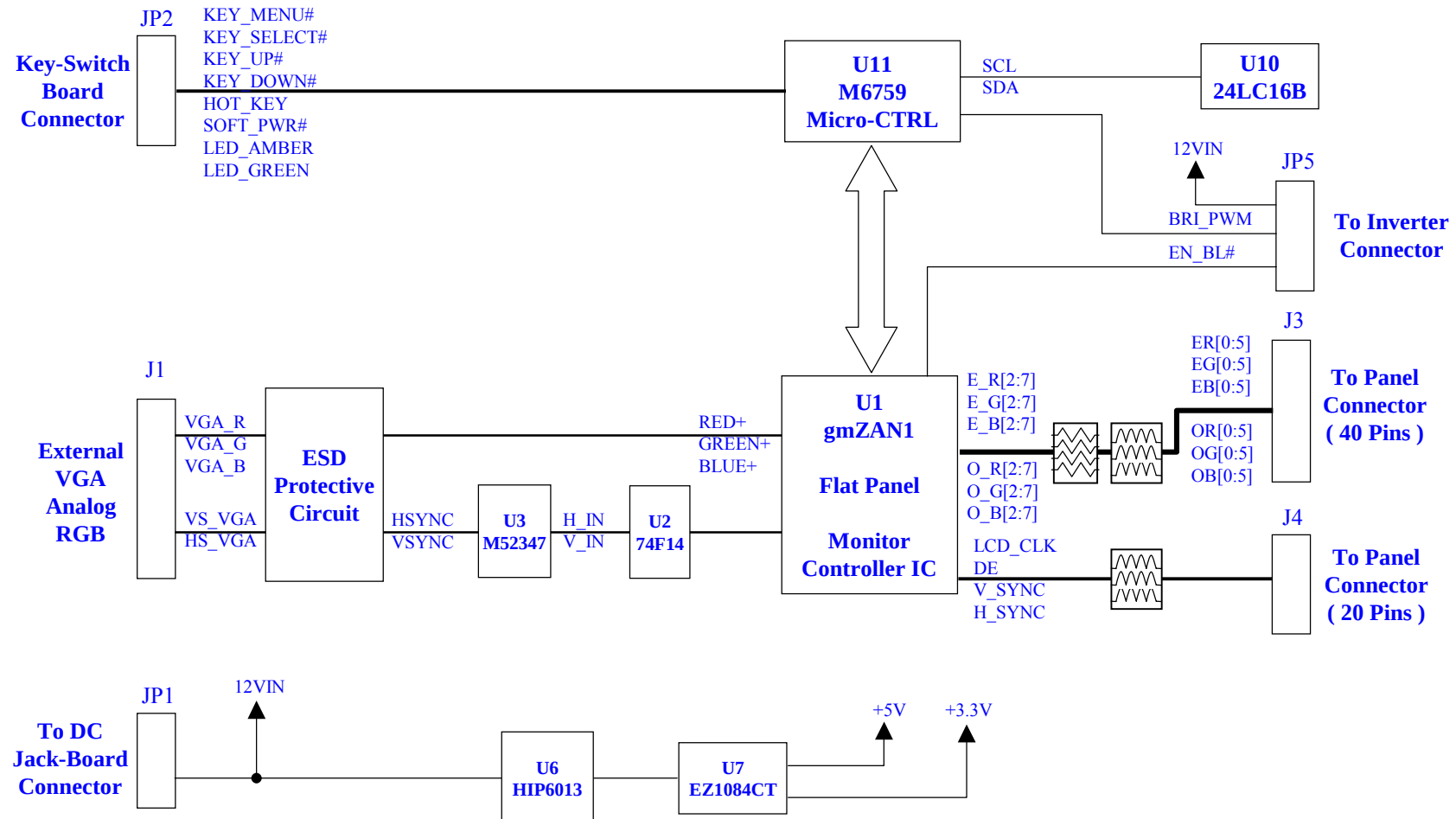
6.1 System Block diagram



LCD MONITOR 15EX2 MAINTENANCE

6. 15EX2 Block Diagram

6.2 15EX2 Interface Board Block diagram



LCD MONITOR 15EX2 MAINTENANCE

7. Troubleshooting

☐ **7.1 No Power**

☐ **7.2 No Display(System Fail) Or Display Abnormal**

☐ **7.3 OSD Function Or Display Abnormal**

☐ **7.4 No Back Light**

☐ **7.5 PC Can't Detect LCD Monitor Type**

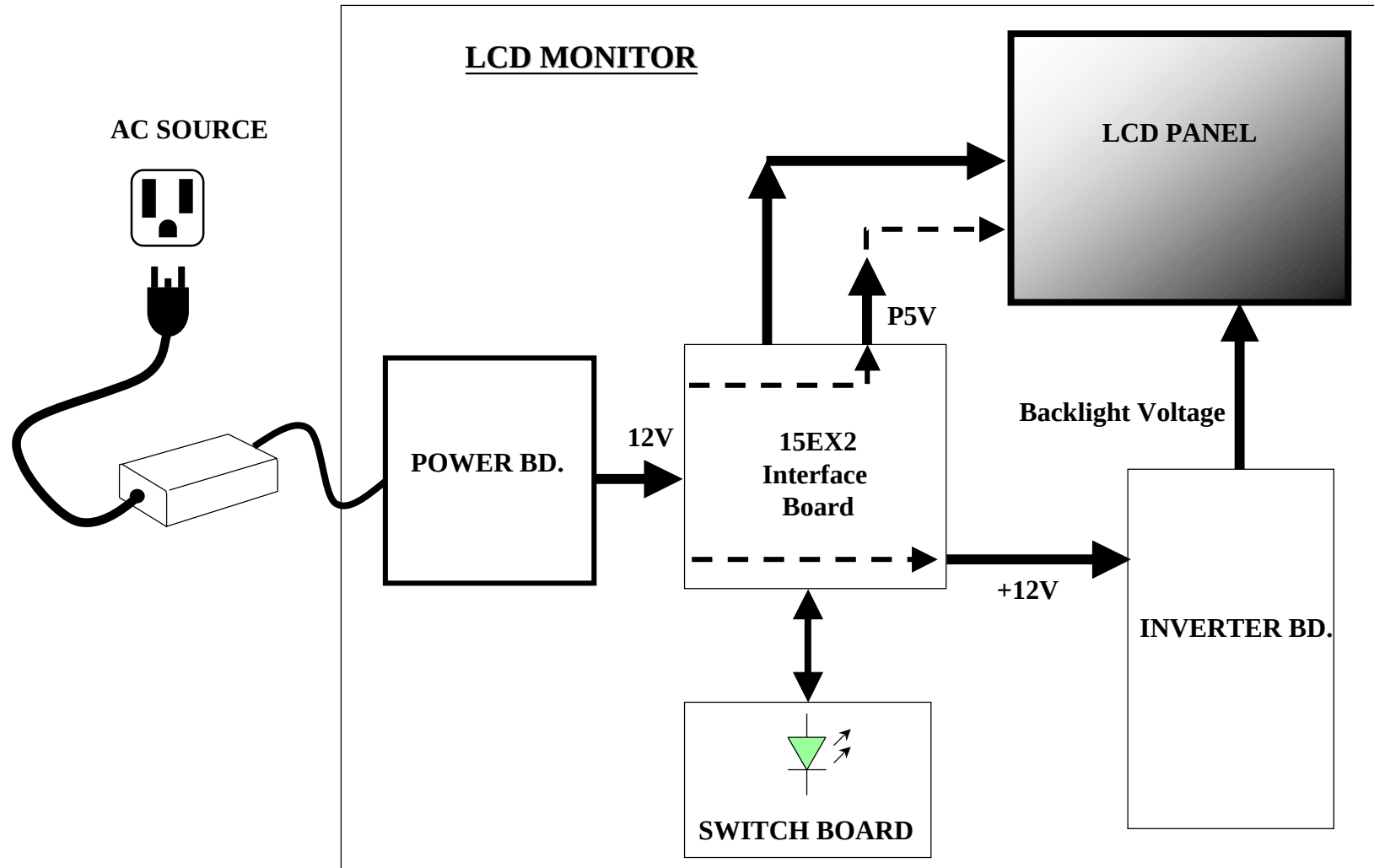
☐ **7.6 LCD Monitor Audio Function Abnormal**

LCD MONITOR 15EX2 MAINTENANCE

7.1 No Power

Symptom:

When the power switch is turned on, nothing happens, power indicator is not light up.



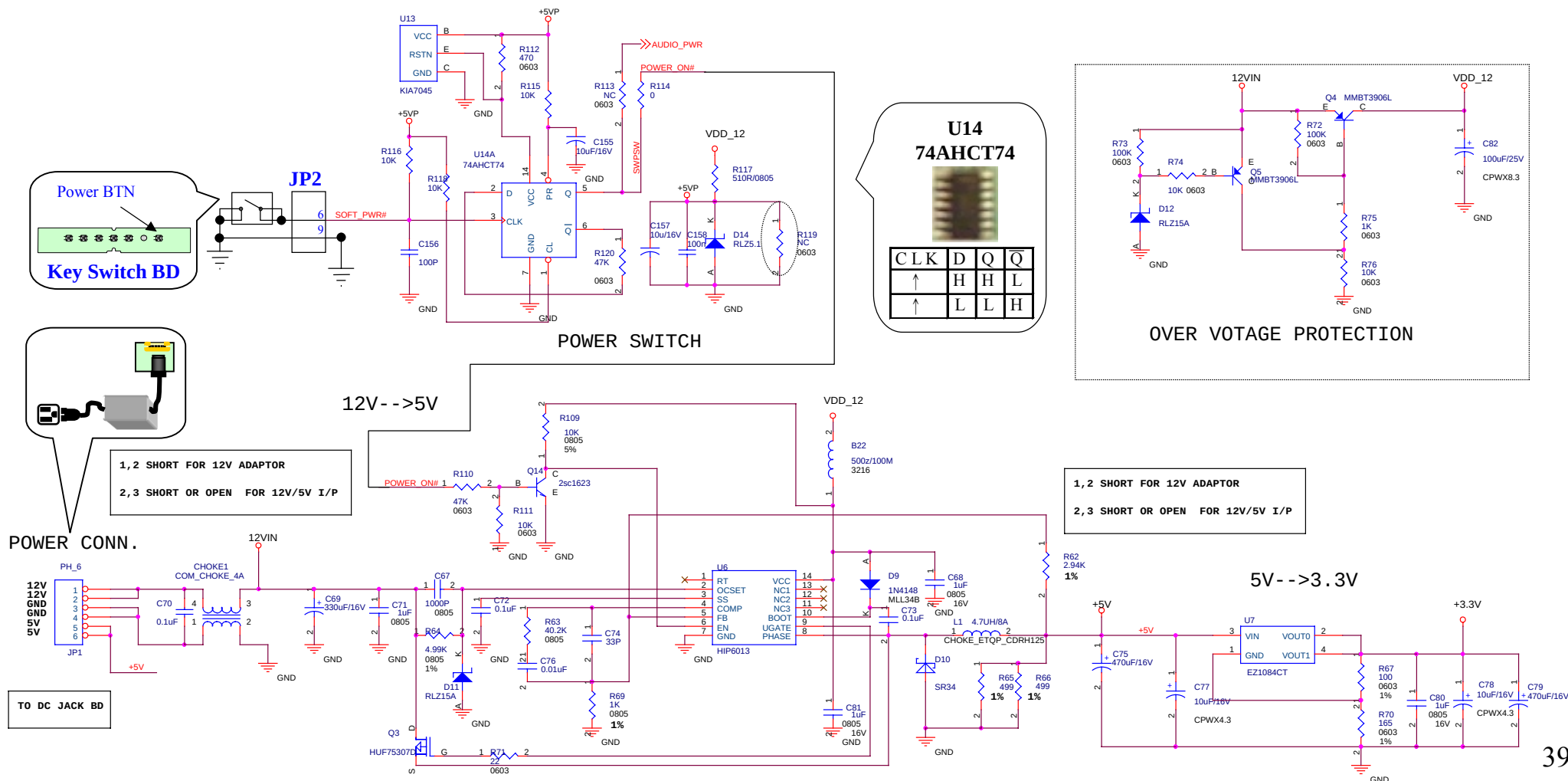
LCD MONITOR 15EX2 MAINTENANCE

7.1 No Power

Symptom:

When the power switch is turned on, nothing happens, power indicator is not light up.

POWER BOARD 12V TO 5V

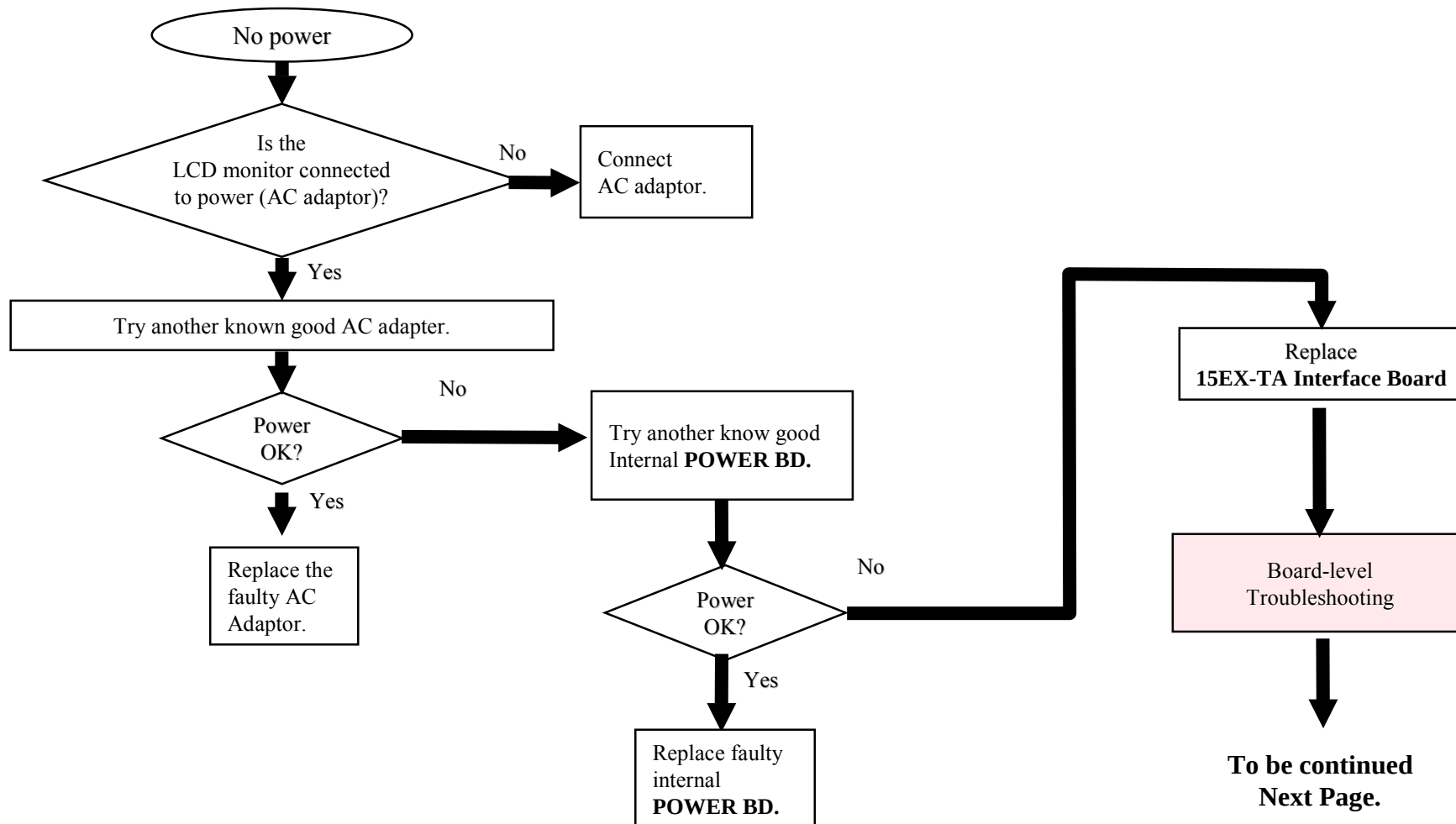


LCD MONITOR 15EX2 MAINTENANCE

7.1 No Power

Symptom:

When the power switch is turned on, nothing happens, power indicator is not light up.

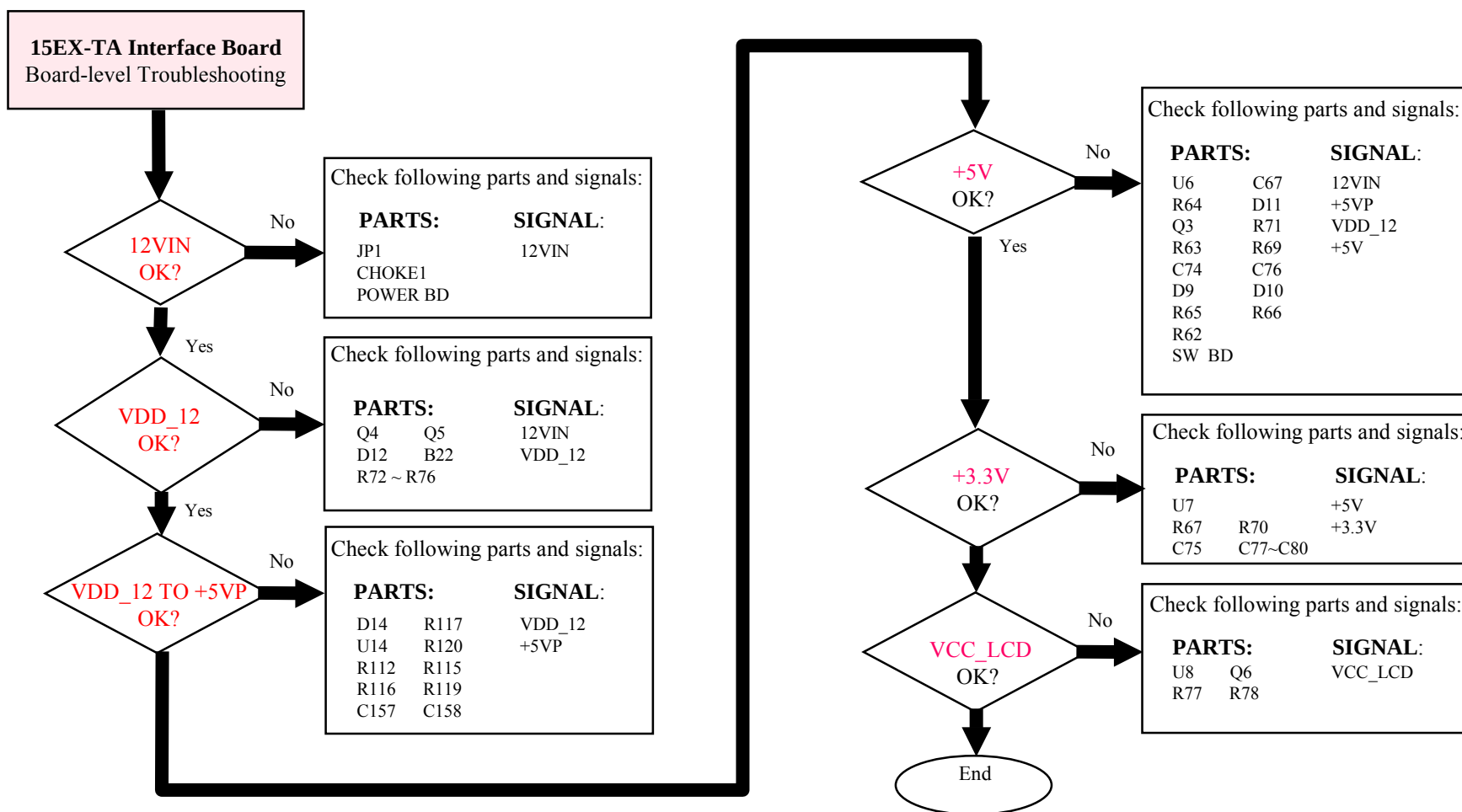


LCD MONITOR 15EX2 MAINTENANCE

7.1 No Power

Symptom:

When the power switch is turned on, nothing happens, power indicator is not light up.

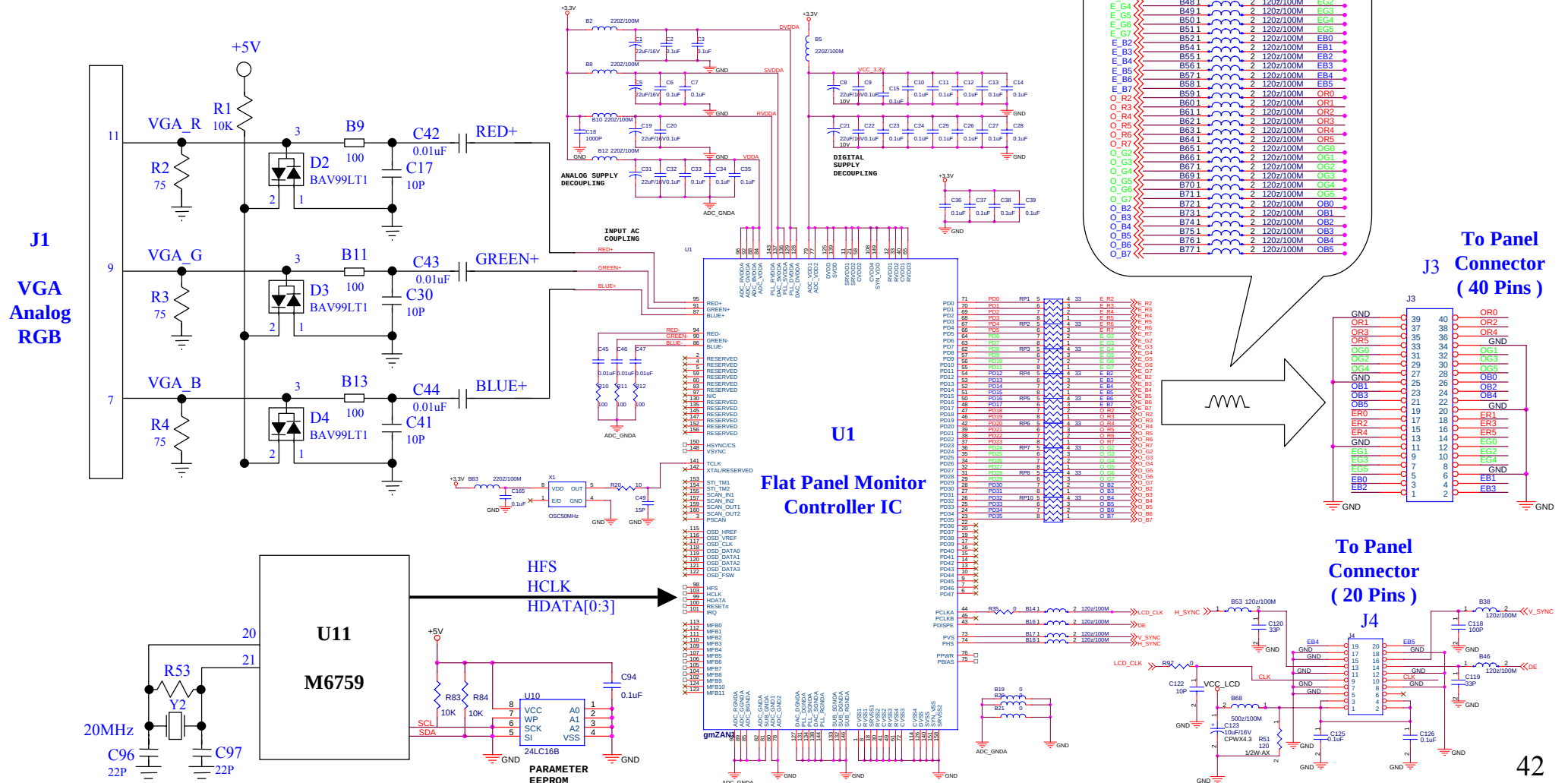


LCD MONITOR 15EX2 MAINTENANCE

7.2 No Display(System Fail) Or Display Abnormal

Symptom:

The LCD no display, but power and back light is good. or show abnormal picture.

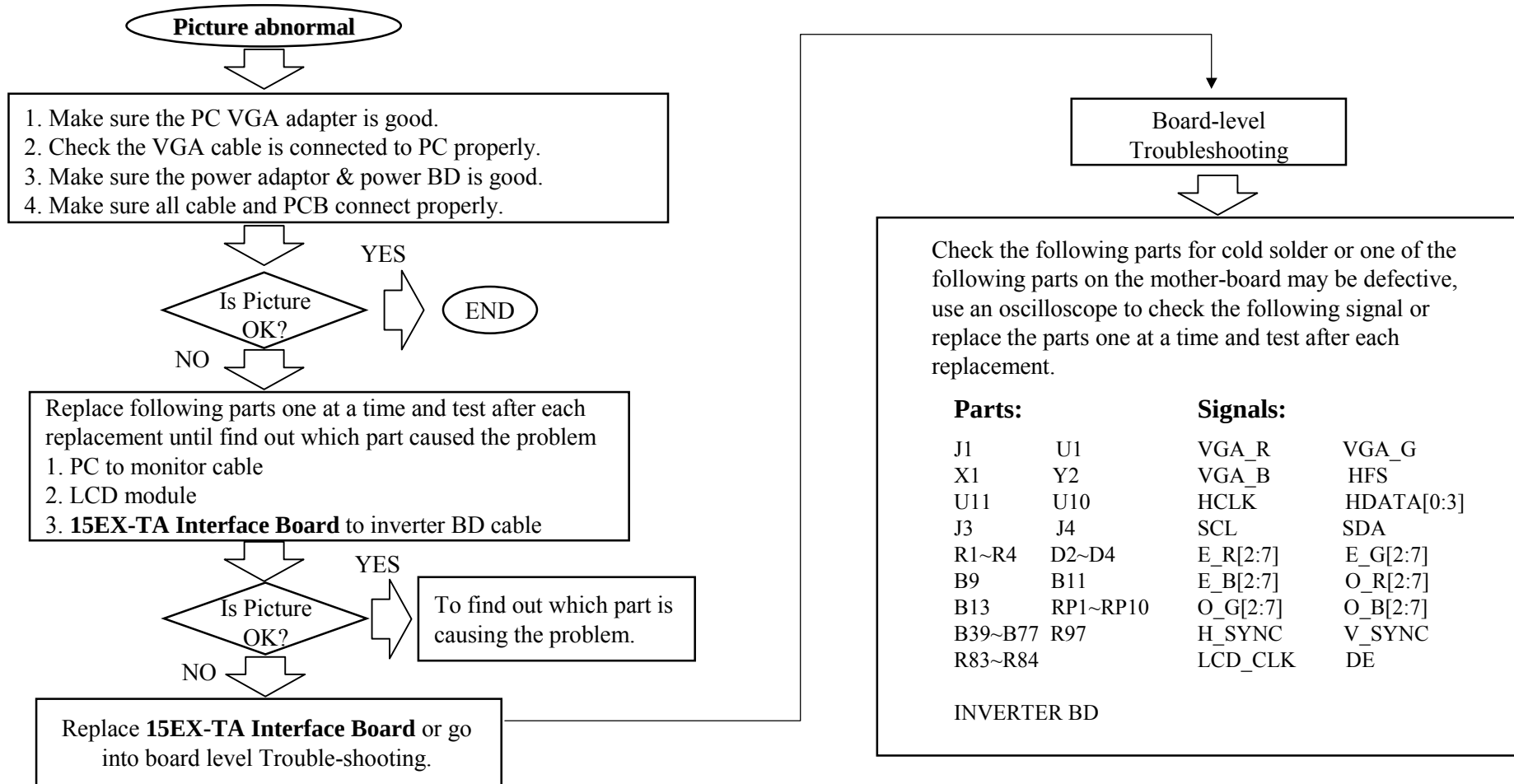


LCD MONITOR 15EX2 MAINTENANCE

7.2 No Display(System Fail) Or Display Abnormal

Symptom:

The LCD no display, but power and back light is good. or show abnormal picture.

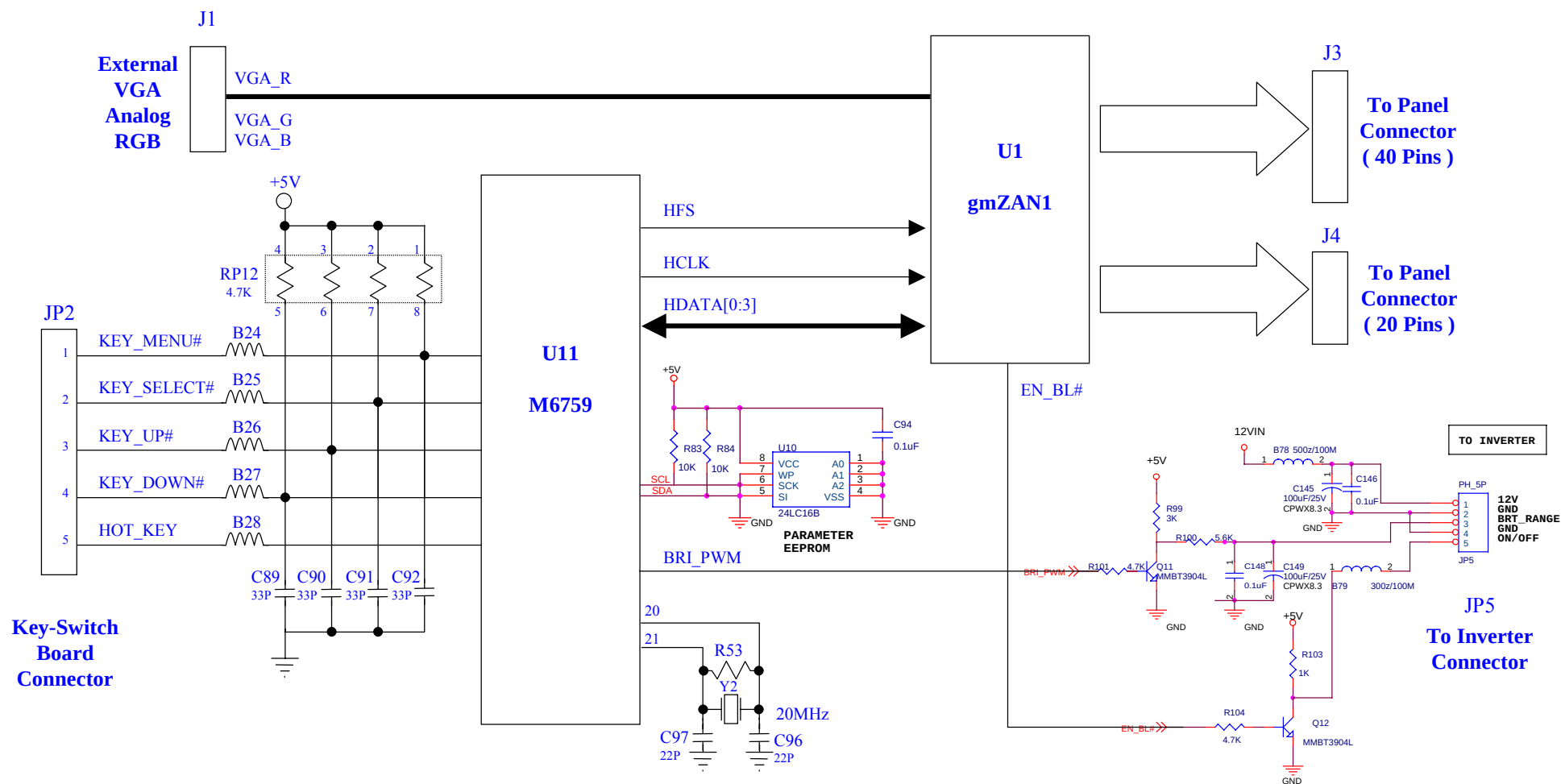


LCD MONITOR 15EX2 MAINTENANCE

7.3 OSD Function Or Display Abnormal

Symptom:

When you pressed the LCD OSD (On Screen Display) button, but no OSD display or the function can not be adjusted.

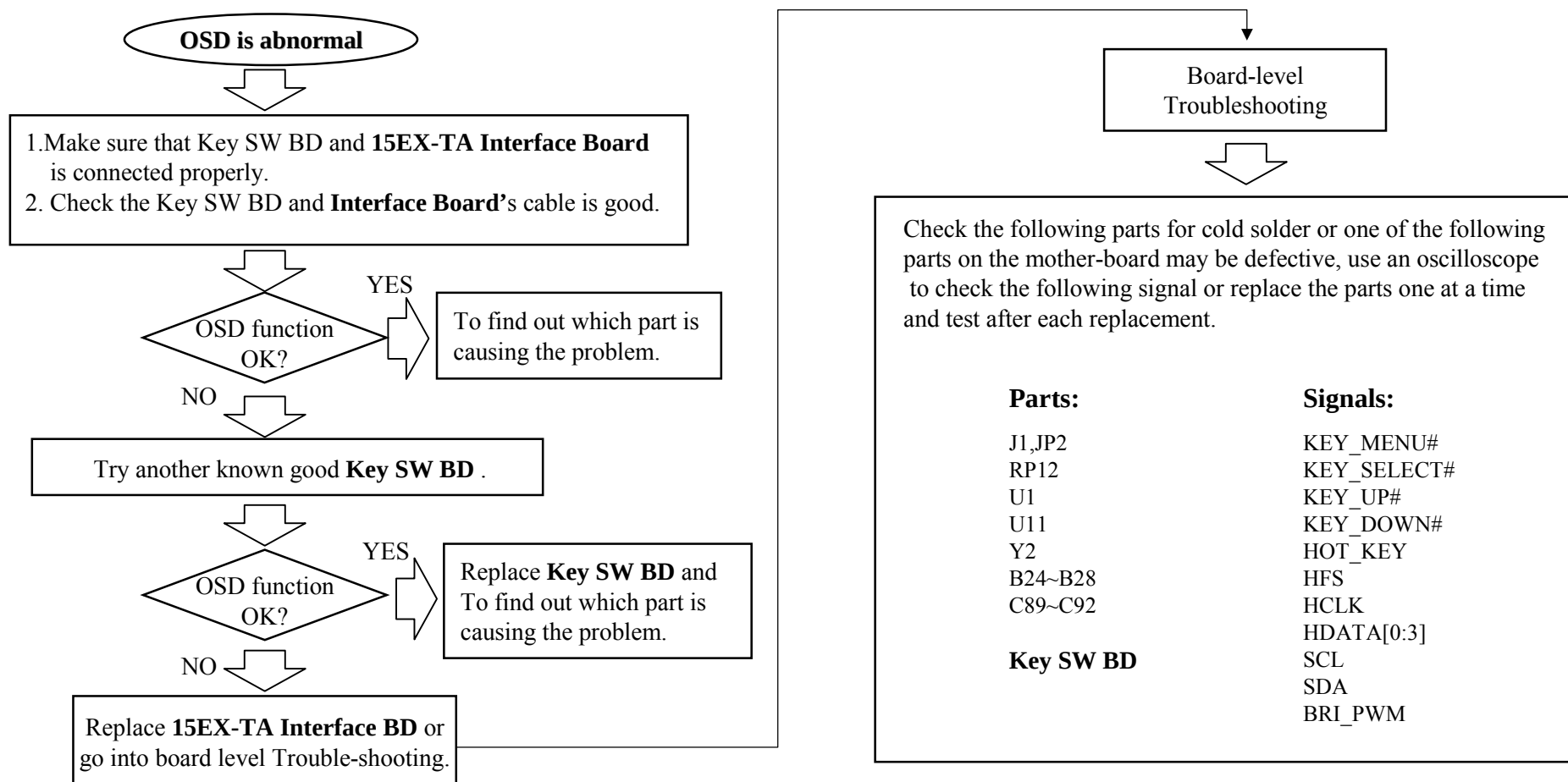


LCD MONITOR 15EX2 MAINTENANCE

7.3 OSD Function Or Display Abnormal

Symptom:

When you pressed the LCD OSD (On Screen Display) button, but no OSD display or the function can not be adjusted.

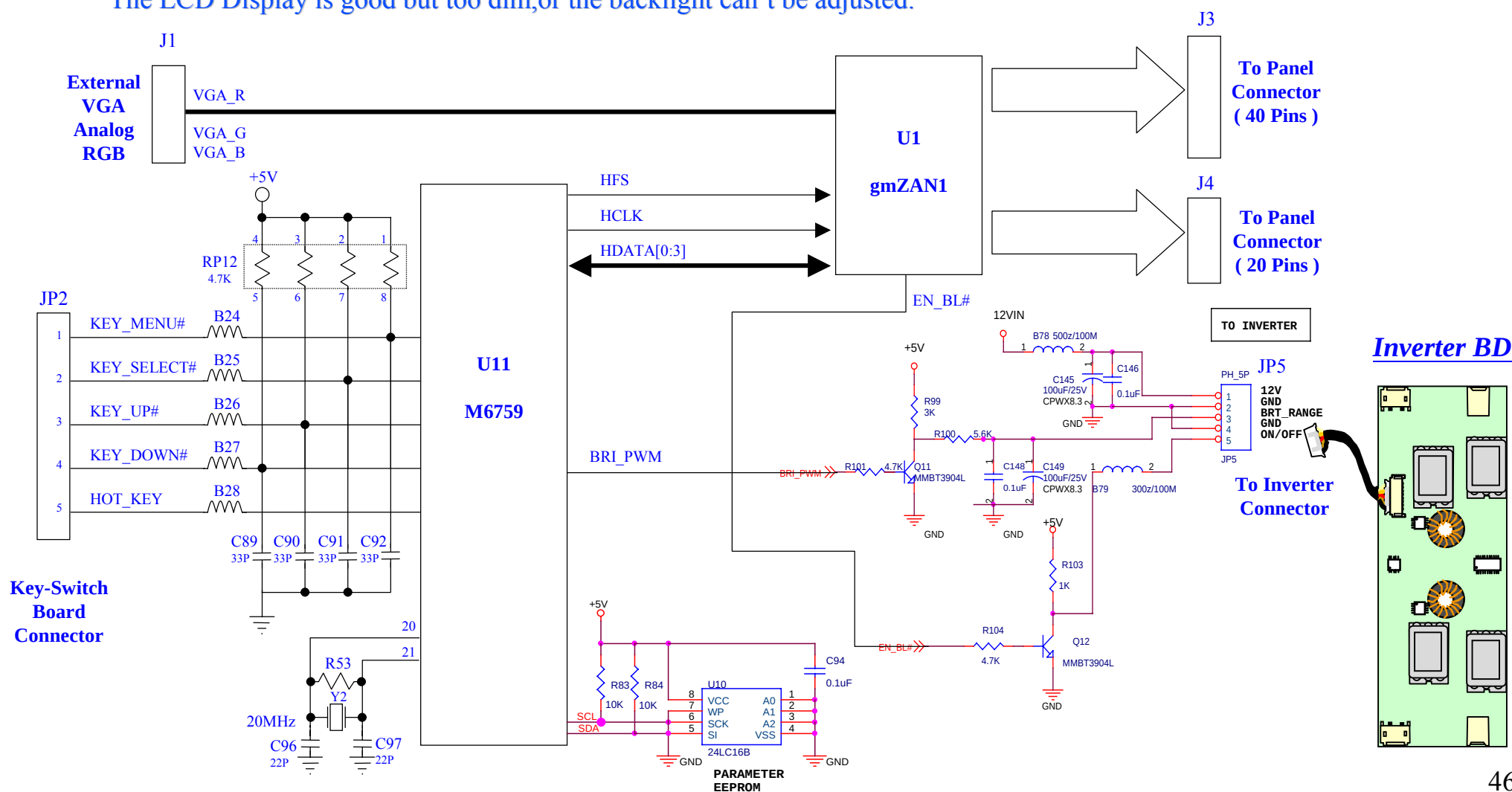


LCD MONITOR 15EX2 MAINTENANCE

7.4 No Back Light

Symptom:

The LCD Display is good but too dim, or the backlight can't be adjusted.

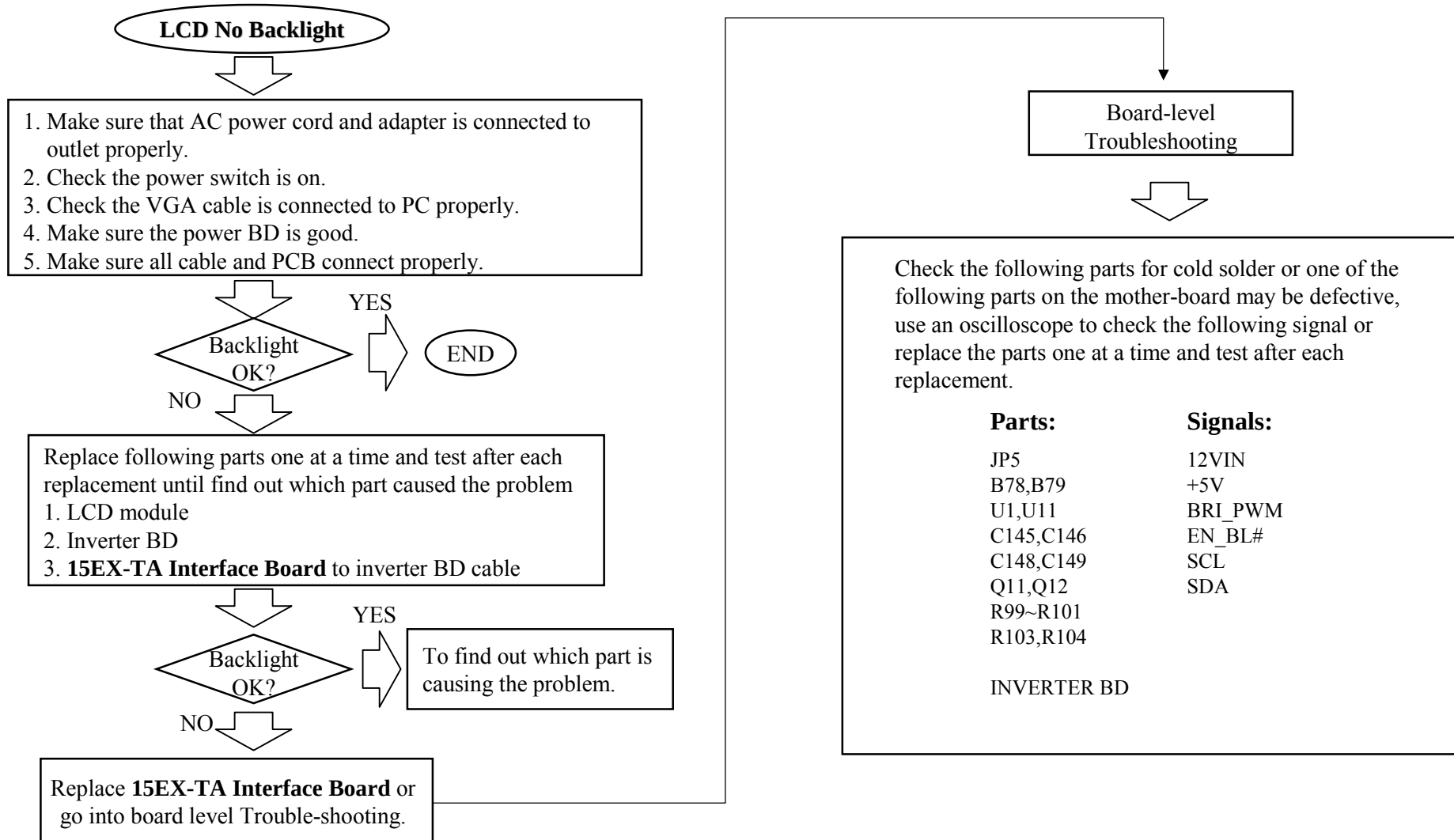


LCD MONITOR 15EX2 MAINTENANCE

7.4 No Backlight

Symptom:

The LCD Display is good but too dim, or the backlight can't be adjusted.

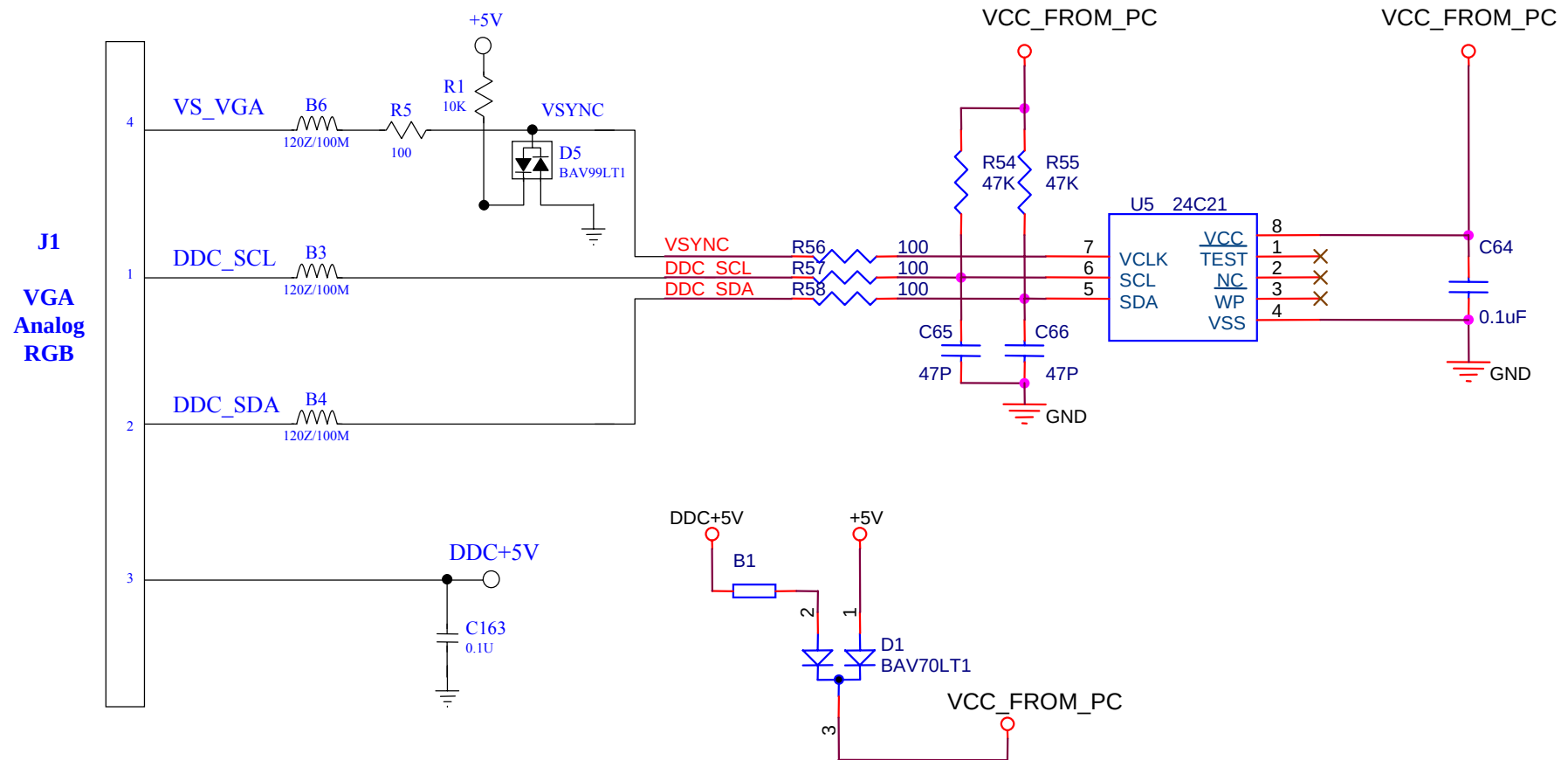


LCD MONITOR 15EX2 MAINTENANCE

7.5 PC Can't Detect LCD Monitor Type.

Symptom:

The PC PNP Operation System Can't Detect The LCD Monitor Type.

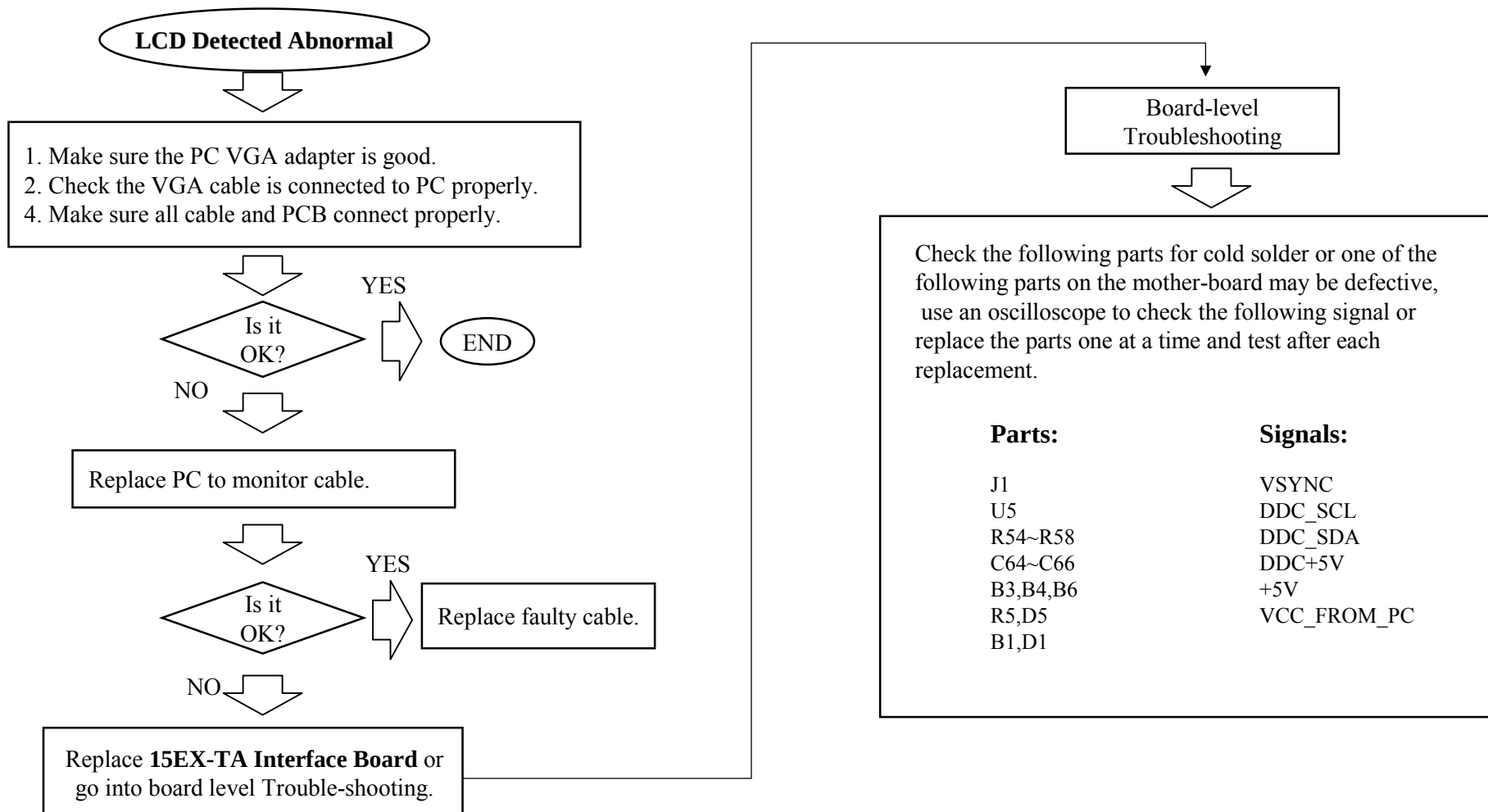


LCD MONITOR 15EX2 MAINTENANCE

7.5 PC Can't Detect LCD Monitor Type.

Symptom:

The PC PNP Operation System Can't Detect The LCD Monitor Type.



LCD MONITOR 15EX2 MAINTENANCE

8. Spare Parts List (1)

Part Number	Description	Location(s)
644204590003	AC ADPT ASSY;36W,12V/3A,API-208-98010	
634415120008	ARM FRONT;15AX	
634415120009	ARM REAR;15AX	
634415120122	BASE FRONT;15AX3	
634215140004	BASE METAL;15A1,SHARP	
634015130003	BASE REAR ASSY;MPT,15EX2	
634415120023	BASE REAR;15AX	
642015150001	BASE/ARM ASSY;T50EX-TA/4SN-ED1-A-GSJ	
622115015001	BINDER;L-TYPE,4 LAYER,W55*H55*L1950	
221600050077	BINDER;L-TYPE,W55*W55*L1130MM	
622115065006	BINDER;L-TYPE,W55*W55*L750MM,LM15CX	
642215130051	CABLE ASSY;SIGNAL,D15/PHR12,SR,15EX	
627207510341	CAP;.01U ,50V ,10%,0603,X7R,SMT	C42,C43,C44,C45,C46,C4
627207310471	CAP;.1U ,25V ,+80-20%,0603,Y5V	C10,C11,C12,C125,C126,
627207510231	CAP;1000P,50V ,5% ,0603,NPO,SMT	C18
272005102401	CAP;1000P,CR,50V,10%,0805,X7R	C67
272075101701	CAP;100P ,50V ,+ -10%,0603,NPO,SMT	C118
627207510031	CAP;10P ,50V ,5% ,0603,NPO,SMT	C122,C17,C30,C41
272075150301	CAP;15P ,CR,50V ,5% ,0603,NPO,SMT	C49
272003105701	CAP;1U ,CR,25V ,+80%-20%,0805,Y5V	C68,C71,C80,C81
627207522031	CAP;22P ,50V ,5% ,0603,NPO	C96,C97
627207533031	CAP;33P ,50V ,5% ,0603,NPO,SMT	C119,C120,C57,C74,C86,
631202839477	CAP;470U ,M,16V,ALU,105'C,D10*12.5,KY	C69,C75,C796312028434
627207547031	CAP;47P ,50V ,5% ,0603,NPO,SMT	C100,C101,C102,C103,C

Part Number	Description	Location(s)
622115152001	CARTON;EPSON,15EX2	
641300020059	CFM-EPSON;LCD,LQ150X1DG51,15",TFT	
627300500001	CHOKE COIL;5UH,4A,4.5TS,10*8*5MM	
361200001015	CLEANNER;APEARANCE,PRC	
633100850009	CON;DC POWER JACK,MA,D2.0	J2
629100012001	CON;HDR,MA,10P*2,1.25MM,ST,SMT,HRS	J4
629100014001	CON;HDR,MA,20P*2,1.25MM,ST,SMT,HRS	J3
331030003007	CON;HDR,MA,3P*1,.1,ST,PL5.842,GOLD,(9	J2
633100110034	CON;HDR,MA,5P*1,2MM,ST	JP5
633100110035	CON;HDR,MA,6P*1,2MM,ST	J1
633100110038	CON;HDR,MA,9P*1,2MM,ST	JP2
633100121201	CON;HDR,SHROUD,MA,12P*1,2MM,R/A	J1
633100120601	CON;HDR,SHROUD,MA,6P*1,2MM,R/A	JP1
633100120901	CON;HDR,SHROUD,MA,9P*1,2MM,R/A	JP1
634415150003	CONTROL COVER;EPSON,15EX2	
288100701002	DIODE;BAV70LT1,70V,225MW,SOT-23	D1
288100099001	DIODE;BAV99,70V,450MA,SOT-23	D2,D3,D4,D5,D6
628810414801	DIODE;LL4148,MELF,SMT	D9
288100015001	DIODE;RLZ15A,ZENER,13.89V,5%,SMT	D11,D12
288100051001	DIODE;RLZ5.1B,ZENER,5.1V,5% ,SMT	D14
628810003401	DIODE;SR34,VRRM40V,3A,DO-214AA,SMT	D10
627260310751	EC;100U ,25V,20%,D8*6.5,85'C,SMT	C145,C149,C82
627260210651	EC;10U ,16V ,20%,D4*5.3,85'C,SMT	C123,C155,C4,C52,C77,C
272602226501	EC;22U ,16V ,M,5*5.5,-40+85',SMT	C1,C19,C21,C31,C5,C8,C

LCD MONITOR 15EX2 MAINTENANCE

8. Spare Parts List (2)

Part Number	Description	Location(s)
622215120003	END CAP;CABLE,15AX	
622215120001	END CAP;L,15AX	
622215120002	END CAP;R,15AX	
648115150001	F/W ASSY;2421,DDC,SO8,15EX2,SHP,EPSON	
648115150002	F/W ASSY;MX10FMAXD,15EX2,SHP,EPSON	
627300130010	FERRITE CHIP;120OHM/100MHZ,1608,10%,S	B14,B16,B17,B18,B3,B38
273000150001	FERRITE CHIP;220OHM/100MHZ,2012,200mA	B10,B12,B2,B33,B5,B8,B
273000130017	FERRITE CHIP;300OHM/100MHZ,1608,SMT	B24,B25,B26,B27,B28,B2
627300110001	FERRITE CHIP;500OHM/100MHZ,3216,SMT	B1,B22,B68,B78
551103200013	FLOPPY DISKETTE;3.5",1.44MB,2HD	
624500010012	FLOW CARD;LCD,WHITE,PRC	
634515100003	GASKET;10*6.5*80MM,1535D,15VX	
634315130002	HEATSINK;B,ZN1,15EX	U1
634415120011	HINGE COVER;15AX	
634215120019	HINGE PLATE METAL;15AX	
634215120009	HINGE;15AX	
634215120018	I/O PORT METAL;15AX	
291000610044	IC SOCKET;44P,PLCC,TIN,W/O PEGS,SMT	U11
628157401401	IC;74F14,HEX INVERTER,SO,14P	U2
628267407401	IC;74HCT74,D-FLIP/FLOP,SO,14P	U14
628341508002	IC;EEPROM,AT24C16,2048*8,SOIC,8P,1501	U10
628341508001	IC;EEPROM,AT24C21,1024,SOIC,8P,1501A/	U5
326301084004	IC;EZ1084CT,VOL REG,5A,TO220,SEMTEC	U7
628450000101	IC;GMZAN1,XGA SCALER,PQFP,160P	U1

Part Number	Description	Location(s)
286306013001	IC;HIP6013,BUCK PWM CTRL,SOIC,14P	U6
628630704201	IC;KIA7042F,4.2V,DETECTOR,SOT-89	U13,U9
628410001001	IC;MX10FMAXDQC,8BIT MICRO CTRL,PLCC44	U11
628130071401	IC;NC7S14,HS INVERTER,SOT23,5P	U16
628630110001	IC;TPS1100,P-MOSFET,PWM CTRL,SO-8P	U8
627300990003	INDUCTOR;47uH,20%,CDRH127,SUMIDA	L1
634415150004	KEY FRAME;EPSON,15EX2	
624200010140	LABEL;5*20,BLANK,COMMON	
242600000372	LABEL;8.3*5MM	U5
242690500078	LABEL;BAR CODE,32*16MM,MD4	
242690500078	LABEL;BAR CODE,32*16MM,MD4	
624215150002	LABEL;BAR CODE,EPSON,15EX2	
624200010020	LABEL;BAR CODE,M1420 COMMON	
242010400004	LABEL;BAREBONE,MENHIR	
242600000379	LABEL;BLANK,14*14MM	
624215150004	LABEL;DISK,EPSON,50EX2	
624215150001	LABEL;RATING,EPSON,15EX2	
624215150003	LABEL;S/N,EPSON,15EX2	
634215150016	LCD BRACKET;L,SHARP,15EX2	
634215150015	LCD BRACKET;R,SHARP,15EX2	
634615120002	LED HOLDER;S/W BD,LED-5*3,50AX	D1
633400010307	LED;ROUND,D5MM,H8.6MM,P2.54,GRN/YEL	D1
634415150017	LENS;EPSON,15EX2	
624315150001	MANUAL;JP,EPSON,15EX2	

LCD MONITOR 15EX2 MAINTENANCE

8. Spare Parts List (3)

Part Number	Description	Location(s)
634215140020	METAL-1;LEFT,15A1,SHARP	
634215140021	METAL-1;RIGHT,15A1,SHARP	
634215140024	METAL-3;LEFT,15A1,SHARP	
634215140025	METAL-3;RIGHT,15A1,SHARP	
633100910201	MINI JUMP;2P*1,2.54MM,H=6MM,OPEN	J2
631445000401	OSC;50MHZ,50PPM,TTL,162-50000-1011	X1
644015120201	PACKING KIT;CONTAINER,15AX	
644015150002	PACKING KIT;T50EX-TA/4SN-ED1-A-GSS	
622115125002	PALLET;A,WOODEN,1330*1030MM,15AX	
622115125003	PALLET;B,WOODEN,900*1030MM,15AX	
643015150002	PANEL ASSY;T50EX-TA/4SN-ED1-A-GSS	
634015150001	PANEL FRONT ASSY;EPSON,15EX2	
634415120001	PANEL FRONT;15AX	
634015120004	PANEL REAR ASSY;15AX	
634415120002	PANEL REAR;15AX	
622115125004	PARTITION;A,1330*1030MM,15AX	
622115125005	PARTITION;B,900*1030MM,15AX	
622115125001	PARTITION;CABLE/ADAPTER,15AX	
641215150001	PCB ASSY;T50EX-TA/INV BD,SHP,EPSON	
622200010020	PE BAG;350*240,ACCESSORY,LCD MTR	
622215152001	PE BAG;FOR PANEL F/R,50EX2	
622200010035	PE BAG;LL-T155AE,T=0.04MM,50RX	
622200030002	PE FILM;SKIN,PACKING,PRC	
634415120025	PUSH-BUTTON;15AX	

Part Number	Description	Location(s)
640015120002	PWA;PWA-15AX-TA/POWER JACK BD	
640015150001	PWA;PWA-T50EX-TA/4SN-ED1 I/F ASSY	
640015150004	PWA;PWA-T50EX-TA/4SN-ED1,I/F,H/I	
640015150005	PWA;PWA-T50EX-TA/4SN-ED1,I/F,SMT	
640015130003	PWA;PWA-T50EX-TA/SW BD	
642200210018	PWR CORD;125V/7A,Y GND,T,6FT,JP,S	
627107100001	RES;0 ,1/16W,0603,SMT	R121,R21,R35,R37,R97
271012000301	RES;0 ,1/8W,5% ,1206,SMT	B19,B20,B21
627107110031	RES;10 ,1/16W,5% ,0603,SMT	R20Replace 62710713303
627107110131	RES;100 ,1/16W,5% ,0603,SMT	B11,B13,B9,R10,R11,R12
627107110431	RES;100K ,1/16W,5% ,0603,SMT	R72,R73
627107110331	RES;10K ,1/16W,5% ,0603,SMT	R1,R109,R116,R44,R46,R
627103413131	RES;130 ,1/2W ,5% ,2010,SMT	R51
627107115331	RES;15K ,1/16W,5% ,0603,SMT	R87,R91
271071165011	RES;165 ,1/16W,1% ,0603,SMT	R70
271002102301	RES;1K ,1/10W,5% ,0805,SMT	R69
627107110231	RES;1K ,1/16W,5% ,0603,SMT	R103,R112,R128,R75
627107110531	RES;1M ,1/16W,5% ,0603,SMT	R53
627107129411	RES;2.94K,1/16W,1% ,0603,SMT	R62
271071221302	RES;22 ,1/16W,5% ,0603,SMT	R127,R36,R71
627107130251	RES;3K ,1/16W,5% ,0603,SMT	R99
627107147231	RES;4.7K ,1/16W,5% ,0603,SMT	R101,R104,R118,R79,R9
627100249911	RES;4.99K,1/8W ,1% ,0805,SMT	R64
627100240221	RES;40.2K,1/8W ,1% ,0805,SMT	R63

LCD MONITOR 15EX2 MAINTENANCE

8. Spare Parts List (4)

Part Number	Description	Location(s)
271071471302	RES;470 ,1/16W,5% ,0603,SMT	R68,R80,R88,R93
271071474301	RES;470K ,1/16W,5% ,0603,SMT	R82
627107147331	RES;47K ,1/16W,5% ,0603,SMT	R110,R120,R54,R55,R78,
271071499011	RES;499 ,1/16W,1% ,0603,SMT	R65,R66
271071562301	RES;5.6K ,1/16W,5% ,0603,SMT	R100
271002511301	RES;510 ,1/10W,5% ,0805,SMT	R117
271071750302	RES;75 ,1/16W,5% ,0603,SMT	R2,R3,R4
271611330301	RP;33*4 ,8P ,1/16W,5% ,0612,SMT	RP1,RP10,RP2,RP3,RP4,
271611472301	RP;4.7K*4,8P ,1/16W,5% ,0612,SMT	RP11,RP12,RP13,RP14,R
634515120001	RUBBER PAD;15AX	
634515140001	RUBBER PAD;FRONT,L,SP,15A1,50AX	
634515140002	RUBBER PAD;FRONT,R,SP,15A1,50AX	
656511515001	S/W;1.44M,EPSON,50EX2	
637110201003	SCREW;M2,L4.8,FLNG/PAN(+),NIW,NYLOK	
637110301039	SCREW;M3L4,K(+),NIW,NYLOK	
637110301037	SCREW;M3L6,K(+),NIW,NYLOK	
371103010808	SCREW;M3L8,FLNG/PAN(+),NIW/NLK	
637110401005	SCREW;M4,L8,FLT(+),ZNW,NYLOK	
637110401011	SCREW;M4L6,K(+),NIW,NYLOK	
637110401010	SCREW;M4L8,K(+),NIW,NYLOK	
637110401012	SCREW;M4L9,PAN(+),NIW	
634215150002	SHIELDING MEATL A;EPSON,15EX2	
634415120007	SIGNAL CABLE COVER;15AX	
633700150006	SW;TACTILE,12V/50MA,1P,H4.3MM	SW1,SW2,SW3,SW4,SW5

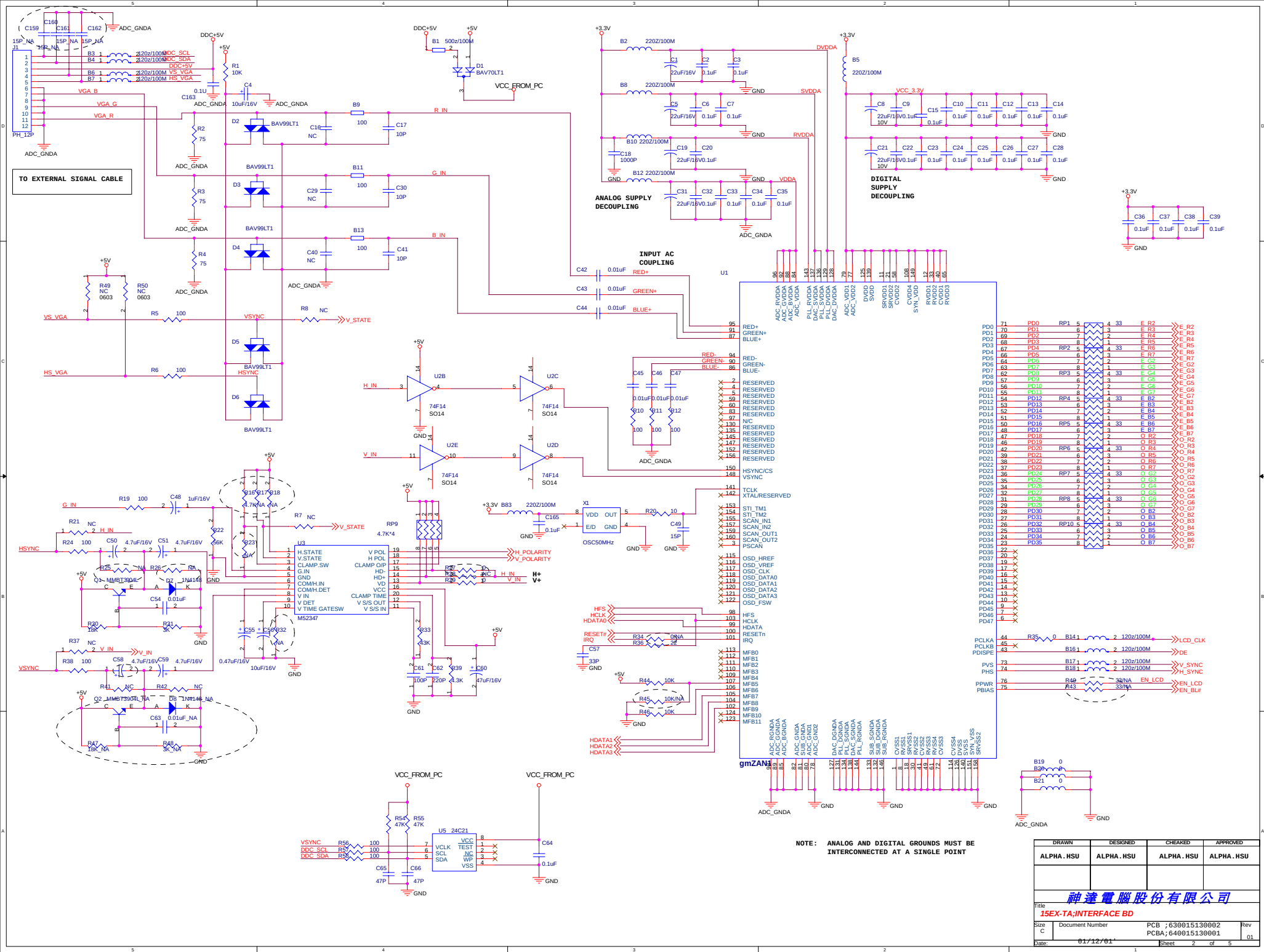
Part Number	Description	Location(s)
225000020001	TAPE;1/2",LIMPID,20YARD/REEL,PRC	
622200000007	TAPE;AC04,FOR CG,COMMON	FOR HINGE PLATE MET
628822112401	TRANS;2SB1124S/T,PNP,SMD	Q4
628827530701	TRANS;HUF75307,N-MOSFET,TO252,SMT	Q3
288203904010	TRANS;MMBT3904L,NPN,Tr35NS,TO236AB	Q10,Q11,Q12,Q4,Q76288
288203906018	TRANS;MMBT3906L,PNP,Tr35NS,TO236AB	Q5,Q6,Q8,Q9
637310302005	T-SCREW;B,M3,L8,FLT(+),1,NIW	
637310301001	T-SCREW;B,M3L8,TRS(+),0,ZNC	
373203010602	T-SCREW;P,M3L6,PAN(+),0,NIW	
634215130003	VESA METAL;15EX	
642215130005	WIRE ASSY;1007,#26,5P,50MM,INV,15EX	
642215150002	WIRE ASSY;1007,#26,6P,90MM,PWR,15EX2	
642215130004	WIRE ASSY;1007,#26,9P,400MM,SW,15EX	
642215150001	WIRE ASSY;I/F TO PANEL,SHP,15EX2	
634415100021	WIRE MOUNT;FW-2C-3M,50VX	
633200010001	WIRE;PACKING,FLAT,PRC	
631412000402	XTAL;20MHZ,30PPM,20PF,HC-49/S,DIP	Y2

15AX2 INTERFACE BD

DRAWING DESCRIPTION

SHEET	DESCRIPTION
2	GMZAN1 R00--->R01 1.Connect A GND to ADC GND---->error. 2.Delete C47&C49 22P and Y1 50MHz---->function Bug 3.Add R21 33 ohm /C44 33P/X1 50MHz 4.Change B3/B4/B6/B7 from 0 ohm to 120z/100MHz---->EMI 5.Del R38/R39/R42/R43/R45 33 ohm---->EMI 6.Add B69/B70/B71/B72/B73 120z/100MHz ---->EMI 7.Change C16/C28/C35 from 10P to 15P---->EMI 8.Add C17/C29/C36 15P---->EMI 9.Add C149 1000P---->EMI 10.Change B65/B66/B67 from 220Z/100MHZ to 0 ohm 1206---->EMI 11.Change R25/R40 from 510 ohm to 100 ohm---->function Bug 12.Add R122 0 ohm---->EMI 13.Change U5 from DIP to S08---->Material issue. 14.Del R31/R32/R36/R37/R53/R54/R55 0 ohm ---->No need
3	POWER/MCU R00--->R01 1.Change C83 from 22uF/25V to 10uF/16V/ R89 from 220K ohm to 47K ohm/ R90 from 4.7K ohm to 470K ohm--->RESET 2.Add Q12 MMBT3904L/R108 from 0 ohm to 10K ohm--->Bri_ctrl circuit 3.Add B74/B75/B76/B77/B78 300z/100MHz(273000130017)--->EMI 4.Change B21/B22/B23/B24/B68/B25/B26/B27 from 120z/100MHZ to 300z/100MHZ--->EMI 5.Change U9 from DIP8 to S08 ---->EE 6.Del R109 0 ohm 7.Change U10 pin15(SOFT_PWR#) and pin16(AUTO_BRI_CTRL)---> F/W request 8.LED GREEN connect to LED GERRN--->error. 9.Add R123 0 ohm---->Bypass 10.Change Q9/Q10 from MM3904L to MMBT3906L---->Decrease power lose 11.Del R96/R99 0 ohm---->No need 12.Change R97/R98 0 ohm to NA---->No need
4	OUTPUT R00--->R01 1.Add Q13 MMBT3904L / R121 4.7k ohm / R120 5.6K ohm ---->Pwm driver not enough. 2.Change R105 from 4.53K ohm to 1K ohm ----> modify integrator volue. 3.Mirror JP6 and change pin2 and pin3 function---->same as 1510A. 4.Add B79 300z/100MHz---->EMI 5.Add C89 33P---->Stable function 6.Change R103 from 22 ohm to 4.99 ohm 1% and C91 from 22P to 10P---->EMI 7.Add C100 100uF/25V--->Material the same 8.Change R107 from 15K ohm to 4.7K ohm and R106 from 470 ohm to 1K ohm ----> Function Stable

DRAWN	DESIGNED	CHEAKED	APPROVED
ALPHA.HSU	ALPHA.HSU	ALPHA.HSU	ALPHA.HSU
神達電腦股份有限公司			
Title 15AX2 INTERFACE BD			
Size B	Document Number	PCB ; 630015120101 PCBA; 640015120101	Rev 00
Date:	10/05/00	Sheet	1 of 5



POWER CONN.

12V-->5V

1, 2 SHORT FOR 12V ADAPTOR
2, 3 SHORT OR OPEN FOR 12V/5V I/P

1, 2 SHORT FOR 12V ADAPTOR
2, 3 SHORT OR OPEN FOR 12V/5V I/P

5V-->3.3V

PANEL VDD SELECTOR

LCD POWER

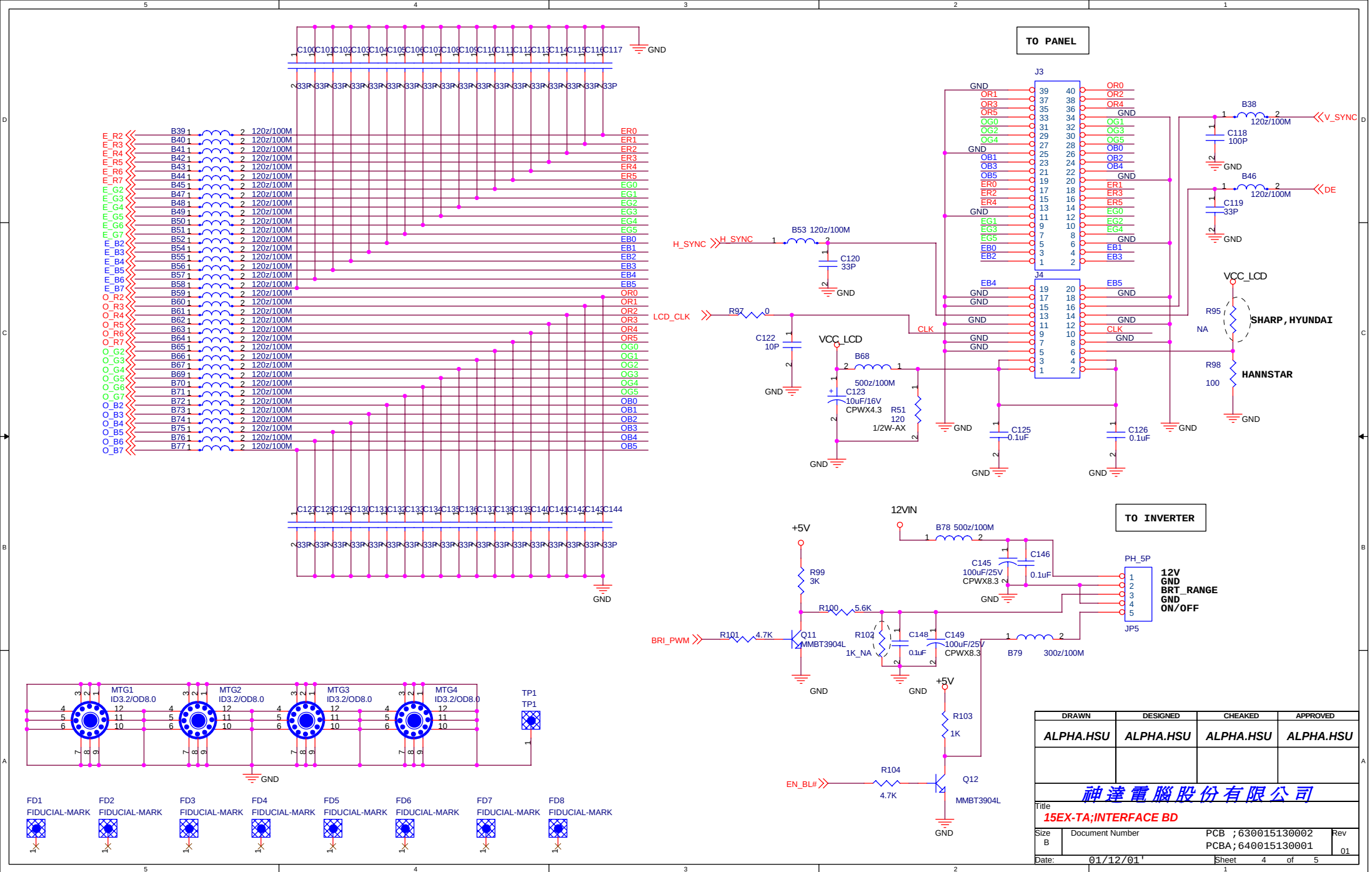
HANNSTAR/HSD150MX42-- 3.3V--->1, 2 SHORT

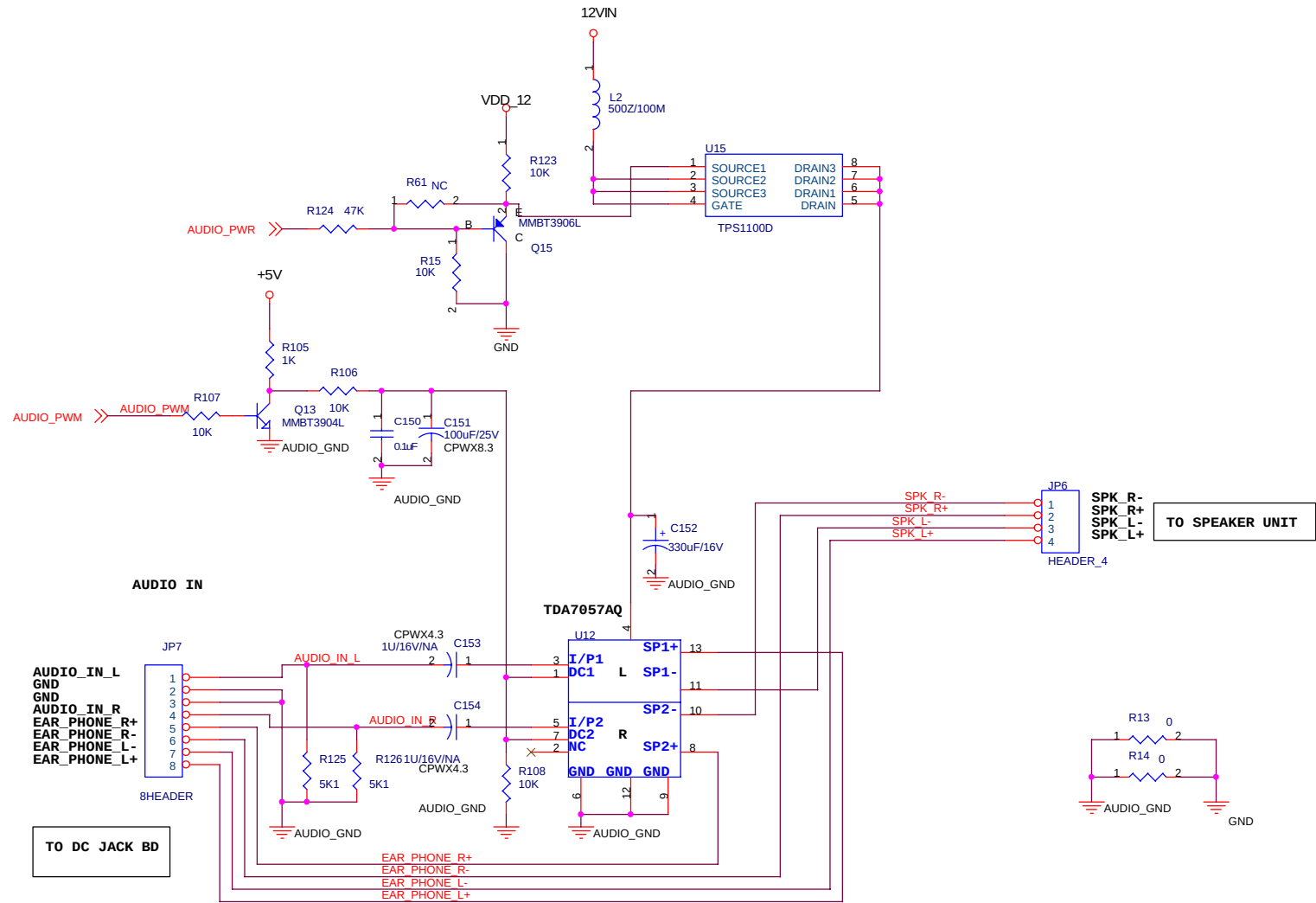
POWER SWITCH

PARAMETER

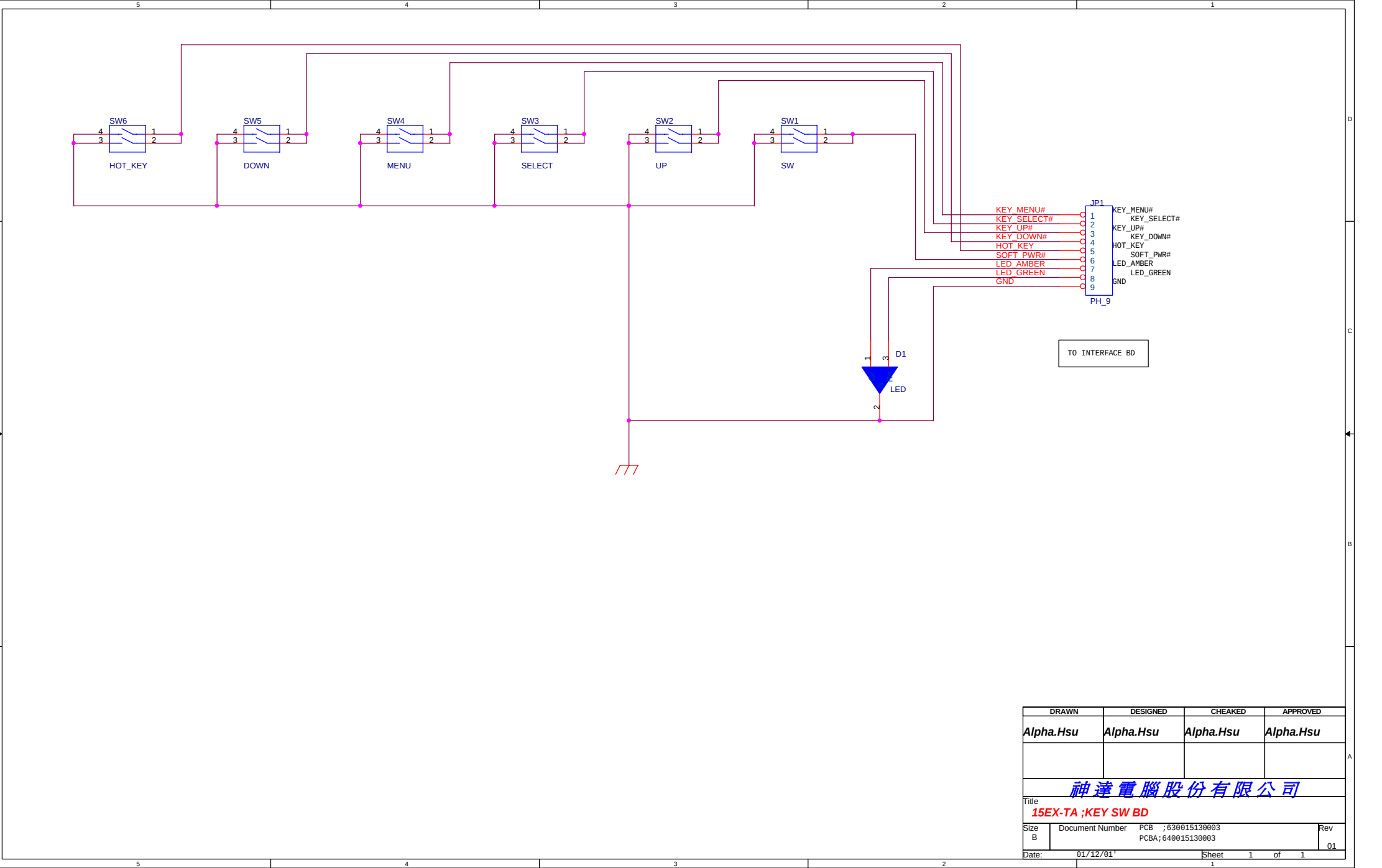
EEPROM

DRAWN	DESIGNED	CHECKED	APPROVED
ALPHA.HSU	ALPHA.HSU	ALPHA.HSU	ALPHA.HSU
神達電腦股份有限公司			
Title 15EX-TA;INTERFACE BD			
Size C	Document Number	PCB ;630015130002	Rev
Date: 01/12/81		Sheet 3	of 5

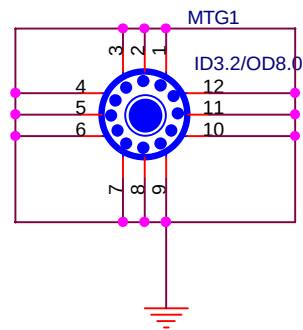
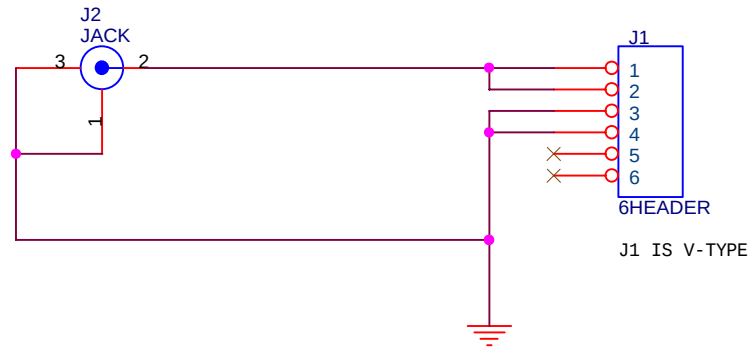




DRAWN	DESIGNED	CHEAKED	APPROVED
Alpha.Hsu	Alpha.Hsu	Alpha.Hsu	Alpha.Hsu
神達電腦股份有限公司			
Title 15EX-TA;INTERFACE BD			
Size B	Document Number	PCB ;630015130002 PCBA;640015130001	Rev 01
Date: 01/12/01	Sheet 5 of 5		



DRAWN	DESIGNED	CHEAKED	APPROVED
Alpha.Hsu	Alpha.Hsu	Alpha.Hsu	Alpha.Hsu
神達電腦股份有限公司			
Title 15EX-TA ;KEY SW BD			
Size B	Document Number	PCB ;630015130003 PCBA;640015130003	Rev 01
Date:	01/12/01'		Sheet 1 of 1



J1 & J2 ON THE SAME SIDE

DRAWN	DESIGNED	CHEAKED	APPROVED
Alpha.Hsu	Alpha.Hsu	Alpha.Hsu	Alpha.Hsu
			
Title PWA;PWA-15AX-TA/JACK_BD			
Size A	Document Number PCB :630015120002 PCBA:640015120002		Rev 01
Date:	Wednesday, April 19, 2000	Sheet	1 of 1

LCD MONITOR 15EX2 MAINTENANCE

REFERENCE MATERIAL

“ 15EX2 ENGINEERING SPECIFICATION ”

Jeff.Lee / Mitac

“ gmZAN1 DATA SHEET ”

Genesis Microchip Co.

“ THE HM15EX2 PRODUCT SPEC ”

Jeff.Lee / Mitac

SERVICE MANUAL & TROUBLESHOOTING GUIDE FOR 15EX2-TA

Sponsoring Editor : Shoestring Tsai

Author : Richard.Wang

Assistant Editor : Kelly Chiang

Publisher : MITAC INTERNATIONAL CORP.

Address : 4F, NO.18, PU-DING ROAD, HSINCHU, TAIWAN, R.O.C.

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First Edition : May. 2001

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